BULLETIN OF THE

TAYLOR SOCIETY

AN INTERNATIONAL SOCIETY TO PROMOTE THE SCIENCE AND THE ART OF ADMINISTRATION AND OF MANAGEMENT

JAN 20 193

IN THIS NUMBER

December Meeting Paper: Analysis of "Recent Economic Changes"

By Robert W. Burgess

Conclusion of Carl G. Barth's Testimony

Engineering Societies Building
29 W. Thirty-Ninth St.
New York

DECEMBER, 1929 VOL. XIV, NO. 6

Objects of the Taylor Society Incorporated

The objects of this Society are, through research, discussion, publication and other appropriate means:

1. To secure—for the common benefit of the community, the worker, the manager and the employer—understanding and intelligent direction of the principles of administration and management which govern organized effort for accomplishing industrial and other social purposes.

2. To secure the gradual elimination of unnecessary effort and of unduly burdensome toil in the accomplishment of the work of the world.

3. To promote the scientific study and teaching of the principles governing organized effort, and of the mechanisms of their adaptations and application under varying and changing conditions.

4. To promote general recognition of the fact that the evaluation and application of these principles and mechanisms are the mutual concern of the community, the worker, the manager and the employer.

5. To inspire in labor, manager and employer a constant adherence to the highest ethical conception of their individual and collective responsibility.

Membership

The membership of the Society comprises Members, Junior Members, Honorary Members, Life Members, Firm Members, Contributing Members and Student Associates. Application for membership should be made on a regular form which may be secured from the Society. New members may be elected directly to the grades marked*.

1. **Member*: An individual interested in the development of the science and the art of management as engineer, executive, operative, scientist, investigator or teacher. Minimum age 28. Initiation Fee, $15. Annual dues including subscription to the Bulletin, $20.

2. **Junior Member*: A younger member. A Junior Member may become a Member without payment of additional initiation fee at 28 years of age and must change to Member at 30 years. Initiation Fee, $5. Annual dues including subscription to the Bulletin, $10.

   For any of the above grades a person engaged in educational work, state service, government service or the service of any other non-commercial enterprise of an eleemosynary nature shall pay one-half the initiation fee and one-half the annual dues of the grade to which elected.

3. *Honorary Member*: A member elected by the Board of Directors for exceptionally distinguished service in the advancement of the science and the art of management.

4. **Life Member*: Any Member who has prepaid all dues by the payment of $500.

5. **Firm Member*: A firm or organization interested in the advancement of the science and the art of management which desires to make the service of the Society available to members of its organization. A firm member designates two representatives (who may be changed from time to time at the organization's discretion) who have all the rights and privileges of membership except the right to vote and to hold office. Annual dues, including two subscriptions to the Bulletin, $40.

6. **Contributing Member*: Any individual, firm or organization desiring to promote the work of the Society by an annual contribution of $100 or more. A contributing member has all the privileges of personal or firm membership, as the case may be, including one subscription to the Bulletin for each $20 contributed.

7. **Student Associate*: A regularly enrolled student of management in any school of engineering, business administration, commerce or arts, of collegiate rank, or a graduate of such institution who has applied for membership not later than one year after graduation, elected upon recommendation of the instructor in charge of management courses. A Student Associate may become a Junior Member, without payment of initiation fee, any time after graduation and must become a Junior Member at the age of 25. Annual dues including subscription to the Bulletin, $3.

All dues are payable in advance, either annually or in semi-annual instalments. The fiscal year is November 1 to October 31. Members elected other than at the beginning of the fiscal year are charged pro rata (quarterly) for the first year.

JAN 11 1930

©CIB 55964

BULLETIN OF THE
TAYLOR SOCIETY

AN INTERNATIONAL SOCIETY TO PROMOTE THE SCIENCE AND THE ART OF ADMINISTRATION AND OF MANAGEMENT

Published by the Taylor Society Incorporated at

Engineering Societies Building
29 West Thirty-Ninth St., New York
Cable address: Taysoc

The BULLETIN OF THE TAYLOR SOCIETY is included in the indexing of the Industrial Arts Index which is obtainable at Public Libraries.

The reprint of extracts up to 50 per cent of the whole of any article is herein authorized, provided the source is mentioned. In return the Society appreciates complimentary copies of the publications containing such reprints. Permission to reprint more than 50 per cent must be arranged through the office of the Society.

Copyrighted 1929, by the Taylor Society Incorporated.

Published every other month. Per year to Members $2.50; to others $3.00. This issue $.75.

Entered as second-class matter, Dec. 17, 1921, at the Post Office at New York, N. Y. under the Act of March 3, 1879.

Vol. XIV DECEMBER, 1929 No. 6

Contents

Comment 237

Recent Economic Changes 238
By Robert W. Burgess
Discussion by C. B. Hammond, George Soule, Royal Meeker, Norman Lombard, H. V. R. Scheel and Edward Eyre Hunt

Carl G. Barth on Scientific Management—Testimony before the Special Committee of the House of Representatives, 1912 (concluded) 254

Reviews of the New Book "Scientific Management in American Industry" 272
By Dexter R. Kimball and Horace Taylor

News of the Sections 275

Reviews 276

Comment

WE BUILDED better than we knew when, on the appearance of "Recent Economic Changes" early last summer, we decided to make that document the basis of the program of the annual meeting in December. What was then expected to be simply an analysis of the report presumably in the calm atmosphere of contentment with a prosperity phase of the economic cycle, proved to be an analysis in that atmosphere of concern which is always generated by the imminence of a depression phase of the cycle.

IT WAS a timely moment for consideration of that important report, for an analysis of it would answer some of the questions raised by the collapse of the stock market. On the whole the analysis was reassuring. It was perceived that, although the collapse of the most extreme orgy of speculation that the stock market had ever experienced was certain to have repercussions throughout industry, nevertheless industry as a whole is better prepared to face a depression than ever before—no general price inflation, a minimum of frozen inventories, abundant credit, widely distributed purchasing power. For during the decade the principles of managerial control which Taylor had developed for management of the shop have come to be applied to all phases of management of enterprise; and in President Hoover's National Business Survey Conference, even to business as a whole. The development of objective expressions of these principles is clearly recorded in management history. First stage: research, standards and measured tasks for the worker at the machine. Second stage: research, standards and measured tasks for departments (sales schedules, quotas, production schedules). Third stage: research, standards and measured tasks for an entire business (master plans, schedules and budgets). Fourth stage (just emerging): research and general plans for industry as a whole ("Waste in Industry," "Recent Economic Changes," National Business Survey Conference). In view of this widespread application of scientific management during the decade, industry will undoubtedly be able to hold the prospective depression down to a mild form; and those individual enterprises which exemplify the new type of management will meet it confidently.

Recent Economic Changes[1]

An Analysis of the Report on Recent Economic Changes of the President's Conference on Unemployment

By R. W. BURGESS

Chief Statistician, Western Electric Company, New York

"RECENT Economic Changes in the United States," the two-volume report of a committee of the President's Conference on Unemployment, is made up of two parts—the actual report of that committee occupying seventeen pages and the reports to the committee of a group of experts, occupying something over nine hundred pages.

As the committee includes men of such diverse interests as Herbert Hoover, William Green of the American Federation of Labor, Owen D. Young, Daniel Willard of the Baltimore and Ohio Railroad and A. C. Miller of the Federal Reserve Board, its conclusions are naturally on very broad lines, as the need for brevity and general agreement would prevent searching analysis of controversial points. Their conclusions, while hardly novel, are nevertheless significant in that they embody the attitude of such leaders of thought and action toward current economic developments in this country. Their most significant conclusions from the point of view of management include the following:

Acceleration rather than structural change is the key to an understanding of our recent economic developments.

The rising standard of living characteristic of the period was widespread and has reached the highest level in our national history.

Investors have invested through the stock exchange not only their savings but also the proceeds of loans until a credit stringency has resulted. The consequences of this process cannot be measured at this time.

The principle of high wages and low costs has been propounded as a policy of enlightened industrial practice.

No prosperous period in the past has shown such a striking increase in productivity per man-hour.

Continuing attention should be devoted to the new problem of technological unemployment.

There has been balance between the economic forces—not perfect balance but a degree of balance which has enabled the intricate machine to produce and to serve our people.

Our situation is fortunate, our momentum is remarkable. Yet the organic balance of our economic structure can be maintained only by hard, persistent, intelligent effort; by consideration and sympathy; by mutual confidence, and by a disposition in the several human parts to work in harmony together.

The reports to the committee of the group of experts include:

1. Introduction, devoted largely to historical orientation, by Professor Gay.
2. A group of chapters on particular divisions of the economic structure—or "industry groups," as one chapter author terms them—Industry (meaning manufacturing and light and power production), Construction, Transportation, Agriculture and Money and Credit.
3. A second group of chapters cross sectioning all industry groups on the basis of economic functions—Consumption and the Standard of Living, Labor, Management, Price Movements, Marketing and the National Income and its Distribution.
4. An analytical review by Professor Mitchell.

Each of these chapters states in compact form the results of the most important recent investigations in its field with an evaluation of their significance. Each chapter was prepared by a specialist in that field who secured, in many cases, the assistance of other specialists for parts of the field. While the chapters are of somewhat unequal value from the point of view of the business executive, most of them well deserve careful study. I wish to call attention to the suggestion made by Dr. Person that a first reading would most advantageously include the Report of the Committee, the Introductory and the Review Chapters and the Summaries at the end of the other chapters.

The analysis in this paper and probably also the study which most executives will find profitable, will proceed by selecting from several chapters the material bearing on certain general business problems rather than by attempting to abstract the chapters or go through them in order as written. Some of the material from the point of view of the problems of business drops into the background as contributory primarily to scientifically accurate description or wise governmental regulation, rather than to management of business and industry. Since the emphasis of the business man, moreover, is on the future, using the present merely as a starting point, it is appropriate for our discussions to magnify anything in the chapters which is of the nature of significant forecast.

---

[1] Paper presented before a meeting of the Taylor Society, New York, December 4, 1929.

The following are some of the major business problems on which, it seems to me, the report throws valuable light:

1. Does the general economic condition of this country furnish a sound background for vigorous expansion by companies attuned to modern conditions? Have conditions really improved in the period 1922 to 1927?

a. What has been the real increase in output per employe? By what means has it been secured?

b. Has an unsound use of credit in instalment selling, stock market speculation, or otherwise, endangered the economic structure?

2. Are large units more effective than small in agriculture, manufacturing, transportation and distribution?

3. Granting that larger units are frequently more efficient, what are the conditions under which such large units can be created by merger of existing smaller units with reasonable prospects of success?

4. What is the importance for a business organization of technical, operating, marketing, financial and general management research?

5. What major changes in distribution of purchasing power have an important bearing on the problems of merchandising?

6. What methods are proving successful in the personnel problems of large corporations?

To return to the first question, briefly—Our General Economic Condition—it is obviously impossible to do more at this time than to indicate some of the most important material in the report bearing on this major question. After the late unpleasantness associated with the quotation factory at the corner of Broad and Wall Streets, the fundamental soundness or unsoundness of our recent prosperity is one of the most important determinants of the future plans of any business man. In one sense, of course, it was the major purpose of "Recent Economic Changes" to assemble the evidence on this question. The general verdict of the report, as I get it, is that:

The economic forces at work in the United States are in the main well balanced, resulting in a very satisfactory economic background for vigorous enterprise adapted to the changing needs and desires of an enlightened public with unprecedently large and increasing purchasing power. On the other hand, an enterprise which does not meet a recognized need or is not in accord with public desires, should recognize that its success depends on its changing itself or the desires of the public.

Economic conditions have notably improved during the period 1922-27. Factory production has increased on the average somewhat more than twice as fast as the population, the rate of increase in certain industries such as automobile and petroleum production being far ahead of this rate. Agriculture has recovered in considerable measure from the post-war slump. Corporate earnings have increased sharply and the financial status of most corporations is enormously improved as a result, in part, of a series of successful years and, in part, of the issue of new securities which remove or much reduce the need for temporary assistance from banks. Average real wages and real income are measurably better, with important improvements in the living standards of most of the population.

But the critic may argue that these changes merely reflect the reaction from the 1920-21 depression and that the future may see a return to old conditions. The answer to this point of view is found in a consideration of the reasons for the improvement which are fully discussed in several chapters of the report.

As stated by Professor Mitchell in his review, all the partial answers given in the various chapters may be condensed into one: "Since 1921, Americans have applied intelligence to the day's work more effectively than ever before. The old process of putting science into industry has been followed more intensively than before; it has been supplemented by tentative efforts to put science into business management, trade-union policy and government administration."

One phase of this application of intelligence to the day's work has been technical research, which has resulted in a continual improvement in design of manufactured commodities and the use of more efficient methods in manufacturing, agriculture, transportation, communication and mining. Perhaps the kind of gain most characteristic of this period has been the result of what may be called "operating research" rather than "design research." For instance, the railroads have increased the average number of car miles per day by eliminating delays to trains by better planning, and have thus saved money by having less idle equipment. The telephone companies have improved long-distance service by introducing the so-called combined line and recording method. Many manufacturing industries have increased the tempo of their processes by the use of mechanical conveyors. Coal mines have modified their whole method of operation in connection with the introduction of mechanical loaders. The construction industries have in part ironed out the winter slackness by better planning. In agriculture, the introduction of the combine has made profitable the exploitation of subhumid regions that previously were merely cattle ranges, and has reduced the time required from harvest to marketing.

It is true, of course, that each of these improvements has involved the design and manufacture of equipment somewhat different from that previously in use, but the motive of the change has been to secure economies in operation as much as to produce improvements in the final product or service.

A further major reason for thinking that we have really advanced is the willingness of American industrialists to install new equipment whenever the savings in cost of operation are estimated to justify it. While several references in this report emphasize the value of labor-saving or time-saving machinery, the results of one questionnaire reported by Mr. Alford seem to indicate an inadequate appreciation of what is really required by the free scrapping policy. The question reads: "Has your company a policy against the purchase of new equipment unless the production savings will return the initial investment within a definite period? If so, what is this period?"

Of nearly two hundred replies received in answer to this question, 43.6 per cent of the companies required that their new equipment should return its cost through savings in a period of two years or less and 64 per cent required that it should pay for itself in three years or less. If the question was correctly understood, such answers seem to me a negation of the accepted progressive American policy, or rather, seem to be the answers that are given to equipment salesmen rather than the real basis for decisions. In my own opinion, the decision as to whether or not new equipment will justify itself, should rest primarily on (1) its probable effective life, allowing for obsolescence and inadequacy as well as wear and tear, and (2) the net annual savings in operating cost. The key question is: What rate of return per annum will be earned on the required new investment in addition to providing at an adequate rate for physical and functional depreciation on the new equipment? The line can then be drawn at a certain rate which must then be equaled or bettered for a project to be approved.

Let us test the two years or less requirement on this basis. Certainly a life of at least four years can be counted on for much new equipment, corresponding to a straight-line depreciation rate of 25 per cent. The two-year rule in such a case implies that no new equipment will be bought that does not provide a net return of 25 per cent per annum on the additional investment. Surely there must have been some misunderstanding here; I cannot believe that progressive American concerns would actually refuse to secure new equipment merely because the return on the additional investment promised to be only 15 or 20 per cent. The limitation to two or even three years looks still worse when applied to machinery for which, on the average, ten-year life may be expected and a 10 per cent per annum depreciation rate is therefore adequate. For such equipment an expected return on investment of 10 per cent would seem to justify the investment if other intangible factors also favored it, but in the terms of Mr. Alford's question, this would correspond to a five-year requirement for return of the initial investment, and the latter period, therefore, seems to be indicated as a reasonable minimum limit for the critical point. Each case, of course, should be examined on its merits. My objection applies to the arbitrary setting of a low limit like two or three years to apply in all cases. Perhaps I should list the question. What should be the criterion by which the desirability of additional investment should be tested? as one of the major questions suggested by the Report, even if the Report does not contribute much of a specific nature, and what it does contribute is misleading. If there really are many manufacturers who are refusing to purchase new equipment which would net 15 or 20 per cent on the amount invested, it would certainly contribute to the Hoover stabilization program for them to change their policy. To be sure, the machinery people have their capacity booked up for some months ahead—but there would be room later.

A further reason for believing that conditions have really improved is the more enlightened attitude on the part of organized labor and, in fact, of wage-earners in general, endorsing more extended use of labor-saving machinery and other methods of efficient management. In the well-known Baltimore and Ohio plan put into effect in the repair shops of that railroad, the union shares responsibility for efficiency and output. The Amalgamated Clothing Workers have gone so far as to undertake the opening of new units of manufacture and to share the burdens of supervision. A growing number of unions have come to a clear notion of their stake in the prosperity of the industry over which they claim jurisdiction. While it is easier to point to concrete examples of this changed point of view on the part of organized labor, it seems clear that most wage-earners have shared in something of the same change of attitude.

Accompanying this underlying approval of more efficient machinery and better methods, there is naturally some doubt in the minds of many workers as to just how they would fare individually if their own work should be transformed by some new development. The continuance of a constructive attitude on the part of labor, therefore, depends on making general the accepted policy of progressive concerns of transferring satisfactory workers to other jobs, if possible, when the old job is scrapped. The execution of this policy is facilitated, of course, by the nature of modern factory work in that much of the ability of a successful worker is transferable insofar as that ability consists of readiness to fit into the prescribed organization, steady attendance, adaptability, and willingness and intelligence required to understand and follow instructions.

Still another reason for the basic improvement in the period 1922-27 is the fact that management has accepted the "doctrine of high wages" and provided the workers with certain supplementary advantages in addition to wages. The "doctrine of high wages" may be stated briefly as follows:

Where an appropriate increase in productivity can go along with an increase in wages, the consequent increase in purchasing power tends to reduce cost and to increase wealth, or

Low labor costs per unit of output may often be obtained by putting more money into the employe's weekly pay envelope in return for greater services rendered.

The "doctrine of high wages" as actually practised implies no "generosity" to employes but merely suitable payment for measured accomplishment. Such measurement may be associated with a gang or individual piece-work system or a task and bonus system or simply a system for making sure that each workman performs a certain scheduled task, with the pace set in many cases by a mechanical conveyor.

While I am disposed personally to avoid the rather vague discussion of the "doctrine of high wages," which seems to imply generosity on the part of the employer, or an altruistic desire to increase purchasing power, it must be admitted that many employers may be influenced by such vague generalizations to act logically under certain conditions which might arouse their prejudices. For instance, the first reaction of an old-style manager on finding a workman's pay check two or three times as large as the average would be to try to stop the repetition of such a "waste." If the "doctrine of high wages," even though imperfectly understood, induces such a manager to investigate the man's record of output to make sure that it is actually much above the average and then to talk grandly about paying high wages to deserving employes in order to increase purchasing power, then the results are fairly satisfactory even if the economic theory is not accurately expressed.

1a. The real test of the reality of the improvement which I have just discussed is the increased *productivity of labor* based on comparison between total physical output and number of workers. This increase amounted in total to 27 per cent in the six years 1919 to 1925—20 per cent in agriculture, 27 per cent in mining, 34.5 per cent in manufactures and 9 per cent in railway transportation. This increase reflects changes in the levels of education and skill in the working population, the growth of capital, the increased use of machinery, the alertness and ingenuity of management, and scientific progress. The measures of productivity are better for mining and transportation than for manufacturing and agriculture, while no satisfactory measures for construction are available. The measures found are too heavily weighted for raw materials and hence underestimate the rise in total output. They also cover old industries better than new. The apparent increase in total productivity and in the productivity in manufacturing reflects in part the increasing importance of industries with high productivity. The combination of partial measures on the basis of dollar values introduces a danger of errors.

The causes of increased productivity are likely in large part to continue to function. These are: (1) the greater growth of newer industries (but some of these, e.g., automobiles, may decline in productivity if demand declines seriously); (2) growth of "payment by results"; (3) more systematic promotion for merit[2]; (4) improving relations between management and employes; (5) improvement in the industrial arts; (6) greater mechanization of industry.

We are justified in believing, then, that improvement in economic conditions in this country is verified by the facts as to increase in productivity and that continuance of this improvement is probable because of continued functioning of the causes of that improvement. One of the main threats against continued progress, however, must be considered—instalment selling. The report shows that while *instalment selling* has become an important element in certain retail selling, especially of automobiles, no large growth seems to have occurred after 1923 and the total annual volume of instalment sales has been running only about 15 per cent of all retail sales. The primary cause for the changes in the volume of business in these lines must be sought elsewhere rather than in instalment selling. As instalment transactions are on the average about half completed at any particular time, the dangerous effects in case of crisis of this method of marketing do not seem as serious as sometimes thought.

1b. The dangers of unsound use of credit in the stock market were viewed more seriously in this report than those likely to result from instalment selling. Increased resort to stock issues has provided funds for larger concerns, with less need to call on the banks for ordinary commercial loans. It is possible that in one or more of the following directions—long period of business above normal, extraordinary large volume of building, of new financing, of automobile production, and of consumption and a huge volume of speculation—an unsound economic structure has been built up, the dangers of which are not now obvious. Only the test of a longer period of time can yield convincing results, in the opinion of the writers of the chapter on Money and Credit. Other material in the report makes it clear that the dangers referred to are primarily short-term rather than long-term.

On the whole, then, examination of fundamental economic conditions justifies active expansion plans, insofar as they depend on conditions outside the particular enterprise. Such is the implication of the report, and I can see no flaw in their argument important enough to change their conclusions and know of no omitted factor which should modify that conclusion.

2. The second main topic in my list, on which this report furnishes valuable material, is "Under what conditions are large units more effective than small in agriculture, manufacturing, railroad transportation and merchandising?" This topic, under slightly different labels, appears on the program for full consideration later in Mr. Williams' paper, Thursday morning, on "Is there an optimum size of organization?" and in Col. Rorty's paper, Friday evening, on "Preserving individual initiative in a large concern," if I may take the liberty of somewhat abbreviating a long title. Under the circumstances, it is appropriate at this time merely to call attention to certain major points suggested by the report without attempting to cover all phases of the subject.

In the section on Agriculture by E. G. Nourse, attention is called to the necessity of larger farm units both in the subhumid regions and in the corn belt. Wheat farms of four sections in the subhumid regions can be handled by two men equipped with modern machinery and the addition of a little seasonal labor. Farms of 5,000, 10,000 and even 50,000 acres are being operated, some of them with striking results, in the way of efficiency and low unit costs. One reason for these larger farms is the nature of the combine, which can operate efficiently on wheat that has not been beaten down by rain and therefore makes regions of low rainfall superior from that point of view to what have usually been considered the more favored regions. Even in the corn belt, close observers are looking with more and more favor on the 640-acre tract rather than the old-time 160 acres as a family farm and are even coming to the conclusion that the better type of business farmers can, and should for maximum efficiency, operate units of 1,000 to perhaps 2,500 acres. Such a farm permits reasonable specialization of the labor force, a full line of modern equipment, and the services of a practical manager who devotes his time fully to the supervision of the technical and business operations of the farm without himself engaging in much, if any, manual labor. There seems seldom to be much advantage, however, in units larger than what can be supervised in considerable detail by one man; that is to say, there seems to be no building up of the long chain of supervisors which is characteristic of large manufacturing organizations.

---

[2] These last two items are emphasized more by foreign observers than by our own experts who know how difficult it is to measure "results" and "merit," and are not so sure we have done it correctly.

In manufacturing, the plant employing twenty to one hundred workers is shown by census figures to have held its own much better than is usually thought. In 1923, the latest date for which this type of summary is available, there were 37,558 such establishments, actually more than in any previous year, while there were fewer than 1,000 establishments employing over 1,000 workers apiece. Plants employing over 250 workers apiece, to be sure, employed slightly more than one-half of all wage-earners, but the small establishment shows no tendency to disappear. Mr. W. L. Thorp, the author of this section, points out that there are certain types of industry in which small-scale production is required. They are: (1) industries in which products cannot be standardized and establishments which make products to suit the differing tastes of consumers, such as those producing tailored suits, high-grade furniture, art goods and finely bound books; (2) industries producing for a small market, such as those manufacturing artists' materials and nets and seines; (3) industries in which the local market is small and whose product has a high transportation cost (in the manufacture of artificial-stone products, or bricks, the activity can seldom be on a large scale because of the limited local market and the high cost of transportation); (4) industries in which the material used is widely scattered and cannot be concentrated because of high transportation cost or perishability, such as, cheese factories and cider mills; (5) industries in which skilled labor is the chief element, such as, engraving and job-printing, whose products are really services rather than commodities.

In spite of these special cases, the potential economies of large-scale production and large-scale operation favor the larger unit where the demand to be supplied is large, uniformity of product essential and transportation cost of raw materials and product relatively unimportant.

In regard to the question of relative costs, Mr. Thorp concludes that at any given time and with any given stage of the industrial arts, there appears to be a size of plant which is most efficient. While the evidence shows a tremendous increase in size of plant during the past few years, and our technical advance has pushed the point of diminishing returns further up the scale, Mr. Thorp feels sure that such a point exists. I leave further discussion of the validity of this point of view to Mr. Williams tomorrow morning.

A suggestion is made in the chapter on Agriculture that some manufacturers tend to distribute their plants to towns and villages adjacent to agricultural land where living is cheaper and the rural population can be drawn on for a working force. No attempt is made to show under what circumstances such advantages would offset the disadvantages of less-than-carload shipment of raw materials and products, of arranging production schedules with a scattered group of such factories, and of recruiting the necessary specialists. I am not sure how much of Mr. Williams' attention this suggestion deserves as it does not seem to reflect much of the production executive's point of view.

In the field of railroad transportation, it is part of the law of the land that larger size of transportation units will be for the best interests of the country. In this case, the larger size is to be secured by the unification of what are already relatively large units. The true objective of rail consolidation is stated to be simplification of rate control, but other advantages hoped for are unification of terminals, more efficient use of equipment and facilities and economies of other kinds through elimination of duplication of effort.

In merchandising, the larger unit in the form of the department store, the mail-order house and the chain store, has come to occupy an important and prominent place in the period 1919-27. Chain store sales in 1927 were over double those in 1929 in the case of candy, five and ten cent and drug chains, nearly four times as great in the case of grocery chains, and over five times as great in the case of wearing apparel chains. In some cases, such as gasoline distribution, chains are operated by manufacturing concerns, an example of increase in size of corporate unit by combination of economic functions. The advantages of the chain as compared with the small unit store are partly those resulting from large-scale buying power, by which concessions can be obtained from the manufacturer, and more efficient methods of management and operation can be developed for standardized merchandise. The success of the mail-order houses reflects in part these same factors and in part the advantages of catalog merchandising as compared with display merchandising. The competition of specialty stores selling style goods is felt by mail-order houses, chain stores and department stores, as personal service seems to be provided more satisfactorily by the smaller unit.

Summarizing tentatively the material on size of unit, it seems clear that one can determine what size of concern and what size of establishment will be most efficient for a given purpose only by a careful analysis of the exact type of work to be done. Standardization is associated with the large unit, individualization with the small. In fact, I should like to suggest that the possibility of an effective large unit depends on the possibility of sufficient standardization of work to be done to permit statistical control. To bring out my point here, consider the possibilities of constructing a country-wide organization for operating in real estate. I do not see how a standard report could be devised by which the central administration could tell whether an operator in a distant town had taken proper advantage of the existing opportunities for the purchase and sale of farms, stores, dwellings and vacant lots. It has proved possible, however, to reduce to report form data which will show whether a chain grocery store or a telephone exchange, a railroad division or an electric power and light central station is functioning efficiently.

But perhaps I am poaching on Mr. Williams' field. The problem is an especially interesting one for anyone associated with a large company and the material in this report stimulates one's thoughts along various lines.

3. The third major question on which the material in the report throws light is stated to be: Granting that larger units are frequently more efficient, what are the conditions under which such large units can be created by merger of existing smaller units with reasonable prospects of success? Mr. Thorp, in the section on the Changing Structure of Industry, states the results of a searching examination of reported facts as to mergers. From one point of view, the most significant point that he makes is that the number of concerns which considered merging but never reached the final stages is enormous. Because of wide general and stock market interest, any merger was likely to receive a great deal of publicity, while the reverse process of separation to secure greater concentration on a single function attracted relatively little attention.

While the general impression that almost every concern has recently merged or is about to merge is not borne out by the facts, there has been a strong movement toward mergers of either the parallel or the vertical type. Noteworthy instances are the combinations of motion picture producers, distributors and exhibitors, the formation of large chains of retail stores and department stores by the combination of small chains or of unit stores, hotel chains, electric and gas public utilities, and banks. The summaries for manufacturing and mining show that the net reported number of concerns disappearing as the result of merger was 760 in 1920, dropped to 319 in 1922 and rose to almost 1,000 a year in the three latest years. The movement is strongest when general business is active and drops when business declines. The summaries for public utilities show an increase in number of companies disappearing from 285 in 1922 to over 1,000 in 1926 and nearly as many in 1927 and 1928.

Recent material as to the success of consolidations is scanty. A study of pre-war consolidations by Professor A. S. Dewing showed that the results of the consolidation period of about 1900 were not very successful for the ten years after consolidation.

The earnings of the separate plants before consolidation were greater than the earnings of the same plants after consolidation. After another investigation the Federal Trade Commission concluded that "there is but little to indicate that the result of combining the plants of wholesale baking companies into a single organization is a lower cost of bread per pound produced."

While the report thus gives some basic information as to mergers, it does not provide an answer for the question as framed, which is really the question faced by business men who are considering merging. The difficulty, as I see it, is that the most pertinent material does not get published in statistical form. I believe more light on this particular question would come from a frank discussion under the auspices of a group such as the Taylor Society, in which various insiders could make generalizations without stating specifically for record that Bank A resulting from a merger is carrying quite a load of superfluous vice-presidents but does not have on its staff the first-class specialist in foreign exchange that it really needs; that Industrial Merger B is proving very successful because price-cutting millionaire X is now inside the fold and can be restrained from doing harm; that Merger C of Electric Light and Power Plants will have to pass through a long seasoning period because several plants were acquired at a very optimistic valuation and because considerable employe and community ill-will was created by the ruthless discharge of superfluous engineers and executives. After a series of frank discussions, it might be possible to formulate the conditions for a successful merger along some such lines as the following:

a. The units merged must form a logical economic entity, which will really gain by having a common general staff, common operating methods, a common sales force and/or a common purchasing department.

b. The financial basis of mergers must not involve fixed interest obligations in excess of developed earning power.

c. The directors and principal officers of the merger must know their business, with enough grasp of changing economic factors to adjust their policies to current developments.

d. The merger must secure a high-grade general staff to formulate plans and methods. If the officers and employes of the merged companies do not contain such men, they must be secured elsewhere; some of them, at least, should have familiarity with the business.

e. The merger must show an obvious improvement in service before it raises its prices.

f. All former employes of the merged units must be treated equitably.

g. The merged concern must have good luck as respects such items as fluctuations in the prices of their raw materials and in consumer demand for their product, deaths of the principal officers, earthquake, fire, pestilence and stock market panics.

4. Enough has been said in connection with other topics to make clear the implication of the report on the question: "What is the importance for a business organization of technical, operating, marketing, financial, and general management research"; namely, that research of all types is necessitated by the rapid rate of change in the economic structure if a business organization is to keep abreast of its direct competitors and other concerns that are after a share of the consumer's dollar. It is unnecessary to enlarge on the necessity for technical research to improve the design of a product. This report, however, seems to me to bring out more especially the need for research of somewhat different types. Changes of methods of operation, including a changed attitude toward personnel problems, necessitate research along such lines. Changes in distribution of buying power, both as between geographic locations and as between economic classes in the community, and the fickleness of public fancy, necessitate marketing research. The development of new financial methods, changing tax laws and public regulation compel research into financial problems and the rapidity of change, intensity of competition and complexity of current economic developments make appropriate something which we may call general management research—investigations intended to facilitate decisions as to general policies.

It may be suggested that my comments imply a high-brow development which smaller companies cannot carry out. I admit that conditions will not always permit full-time assignment of a competent staff to each of these functions. What is called for seems to be at least a recognition of the need and assignment of some qualified person to each of these lines as occasion requires.

5. Taking up more in detail question 5: "What

major changes in distribution of purchasing power have an important bearing on the problems of merchandising," we note first that the increased use of the automobile and the creation of a system of improved highways have produced and are producing a revolutionary shift of purchasing power from smaller to larger centers. The small country town loses trade to the county seat. The county seat, in turn, loses trade, especially in style goods, to the larger towns within automobile radius. The average trading area for consumers outside the urban area has been increased from five or six miles to thirty to 150 miles. The shift of trade away from the smallest communities has made it easier for chain stores to cover the field and is also, in the opinion of Professor Copeland, largely responsible for the weakened position of the wholesalers, many of whom did not realize that their small-town retailer customers were passing out of the picture and that their retailer customers in the larger centers were more easily accessible to their competitors than they used to be.

Another change in the distribution of purchasing power results from the increase in real wages. Workers who before the war had no margin for expenditures above necessities, are now able to secure a more varied diet, better housing, silk stockings and radios. In the period 1913 to 1926, the report states that real wages, that is to say, wages adjusted for changes in the purchasing power of the dollar, rose 18 per cent for wage-earners and real salaries rose 9 per cent. It should be noted in considering these figures that the adjustment for varying purchasing power of the dollar is based on out-of-date analysis of workmen's budgets. Most careful studies of the effect of wage increases on purchasing power would not use these percentages of increase in real wages as an exact quantitative guide. The total number of salaried workers has grown more rapidly than the number of wage-earners. Business men, producing necessities suited to the lowest incomes, find that their market has increased no more than in accord with the population increase, perhaps less, while those producing goods and services of the seminecessitous or comfort grade find a greatly enlarged field.

Another change in type of demand that may be noted is a continued decline in the agricultural population and an increase in the numbers engaged in government work and merchandising.

The above comments are taken from the second section, "Changes in Retail Trading Areas," of Professor Melvin T. Copeland's chapter on Marketing, and from Mr. Morris A. Copeland's chapter on the National Income and its Distribution, supplemented by material in Mr. Wolman's chapter on Consumption and the Standard of Living. I commend all three chapters to the attention of any business man who has found his market weaker than he can explain or is looking for new fields to explore.

6. Another question which I listed was "What methods are proving successful in the personnel management of large corporations?" "Personnel management today," says Mr. H. S. Dennison, in the chapter on Management, "is tending to emphasize the responsibility of line officers for sound relationships, but to give staff personnel men the task of analyzing and criticizing personnel results and devising and installing measures to make them progressively better. The main items of a sound personnel program are:

a. Wages and salaries adjusted to the fair average market level for the type of work done, with due recognition of growing skill, greater responsibility and unusual abilities.

b. An adequate procedure for selecting applicants well suited to the particular job to which assigned. This involves physical examination, in the case of some companies, trade tests or mental tests, and personal interviews.

c. Good system for training, usually in part by rotation to various related jobs, either in accordance with a schedule or as opportunity offers. Good systems also include conferences, out-of-hour courses, company, department or plant magazines containing some personal notes, some entertaining and some instructive articles, and many illustrations.

d. A regular plan for adjusting compensation at regular intervals, with promotion in rank as well as in pay the normal result of demonstrated excellence.

e. Regularity of employment, with efficiency and length of service important factors when lay-offs are necessary.

f. Sickness disability allowance, death benefits and/or group insurance and/or salary deduction insurance.

g. Pensions on reaching certain specified ages and completing a specified period of service. A pension system is a matter of sound managerial policy to promote efficiency by providing suitably for the retirement of employes after they reach an age at which many are less efficient than the men available to move up into their places. From the company point of view, pensions are at least as important for vice-presidents as for watchmen.

h. In many cases, a plan by which employes can purchase the preferred, or sometimes common stock of the corporation, in order to give the employe an opportunity to save for old age to supplement his pension, and to give him the point of view of the stockholder as well as that of the working force.

As the object of this paper has been to suggest what kind of use can be made of the committee's report, and to formulate some of the questions it raises, a peroration or even a concluding summary seems inappropriate. I prefer instead to suggest further discussion, by closing with several additional questions which I have not time to discuss, but noted as I analyzed the various chapters of the report.

Additional Questions

7. To what extent are relative *price* changes, as between different commodities, influenced by the possibilities of applying to their production and distribution mechanical aids and scientific discoveries? It seems obvious that *costs* will be so changed; should the benefits of such mechanical aids and scientific discoveries be retained by the producer, the maker of the equipment or the discoverer of the principles, or by the consumer of the goods?

8. Is it to the best interests of corporations to lend their surplus funds in the call money market in such a way as to facilitate speculative booms in the stock market?

9. What steps, such as spreading information and stimulating ambition, should be taken to induce no-profit or small-profit enterprises, with poor prospects, to liquidate?

10. On what basis can a fair distribution of profits be made between the various factors which deal with a given product or service—designing, manufacturing, selling, financing?

11. What net rate of return per annum should be considered requisite for launching a new enterprise or for purchasing new equipment to reduce operating costs?

Discussion

C. B. Hammond.[3] I am going to confine myself quite rigidly to three points in the paper, selected arbitrarily, which seem to me of particular importance. The first is research, the second the high wage doctrine, and the third is the question of the relation of size to efficiency.

Terminology and habit seem to get in the way of the proper development of research in the field of management. When people speak of research they ordinarily have in mind physical and chemical laboratories and are very enthusiastic. When they speak of research in a business or financial organization they ordinarily mean studies of a statistical nature concerning things that have already occurred, and they are not nearly so enthusiastic about this sort of thing. Research should be just as inventive in the field of management as in the field of the physical sciences, and it will have to be before the problems of management can be adequately solved.

The second point relates to the high wage doctrine. There is a suggestion of inflation in the statement of the doctrine as it is given in the books and as Mr. Burgess has paraphrased it in his paper. Because of my connection with a bank I suppose it is natural that I should react unfavorably to any such suggestion. I think the primary significance of the doctrine of higher wages is social. It is only secondarily that it concerns the individual employer as a practical problem. It might be stated as follows. There is a full volume of purchasing power when a large proportion of employable consumers are at work and receiving good wages; this full volume of purchasing power sustains a full volume of production, and this full volume of production wholly absorbs the cost of active employment at good wages. Since this is the case in general, it is to the interest of the individual employer to govern his own practice, insofar as possible, accordingly. The corollary is, of course, that there is a diminished purchasing power when a large proportion of employable consumers is out of work and receiving low wages; this diminished purchasing power reduces the volume of production, and this reduced volume of production can absorb the cost of only partial employment or of only low wages. When this is the case in general, it is to the interest of the individual employer to govern his own practice, insofar as possible, accordingly. When the second condition holds and the various factors operate in a vicious circle, you have depression; when the first condition holds and the factors interact in a benign circle, you have prosperity. Whichever the situation, when once the forces are set in motion they tend to maintain themselves. It is one of the purposes of this study, and possibly the finest, to try to keep the forces from becoming unfavorable, because of this tendency of the circle to complete itself.

---

[3] Irving Trust Company, New York.

The third point is the bearing of size on efficiency. Certainly there is no point of livelier interest, nor one on which figures can be more misleading. Comparative cost figures which attempt to show the inefficiency of large-scale production too frequently fail to take into consideration all the factors. The case is not proved against large-scale organization by figures showing that at any given time it is not so good. I should say that where there is inefficiency it is the fault of the management rather than the size. When the management gets the idea, it can be expected to overcome difficulties that might be supposed to be insuperable.

Generally the problem is regarded as static. As a matter of fact it is dynamic, dealing with phenomena that are constantly in motion. In the field of banking, where mergers and consolidations have been carried on with feverish activity, there is scarcely ever any realization of the possibilities of change in management. I do not mean changes in personnel, but changes in method. The point of view in general is that we have the best banking system in the world. To a lesser extent this is true in industry as well. We must realize that large-scale organization is a thing that is becoming, and not a thing that is and always has been.

Management must be adequate to size. And it must not be expected that two units when added together will necessarily produce twice as much. It is not a matter of putting two and two together and getting four; it is a matter of putting two and two together and getting something like seven or eight. Large-scale operation is comparatively new and consequently the difficulties are apt to be viewed without realizing the possibilities of research. It is possible to measure the wieldliness of large-scale organizations and to find their point of efficiency. What is much more difficult to measure is the important and essential element of inventiveness and ingenuity that man brings into operation when he feels the pressure of difficulties that he may at the outset have thought insuperable. Many managements are content to handle immediate routine problems without considering the future. And many managements that are quite capable under a given set of conditions show no inclination to examine the permanence and stability of those conditions. They are taken for granted, and when change occurs their capabilities are in danger of vanishing. Research in business has this matter to deal with as well as improvements in technique.

The problem of large-scale organization amounts largely to one of personnel. It will fail when the people in it are not for it. A large-scale organization cannot be run merely from the top. Management must do three things. First, it must discover such qualities in people as adaptability, energy, inventiveness; second, it must place people possessing these qualities where there is scope and opportunity for the exercise of them; and third, it must compensate them commensurately with their accomplishments.

George Soule.[4] I am going to concentrate on two points made in the paper. One is the same that Mr. Hammond discussed — the doctrine of high wages. The other is minor, the growth of industrial pension systems. Since there is much less to say about the latter and since it has come less within my studies, I think perhaps it had better be taken up first.

I merely want to direct attention to a recent report of the Industrial Relations Counselors, Inc., which points out, as I understand it, that industrial pensions adopted by private concerns have proved to a great degree disappointing. The motives behind these pensions were the stabilization of working forces, the reduction of strikes and labor turnover, increased satisfaction, and so on, besides the ordinary motive of eliminating superannuated employes who have become inefficient. The investigation reveals that the firms that have not installed pension systems have gained practically the same advantages from reduced labor turnover and absence of strikes as the firms that have installed them. On the other hand, many of the pension funds are proving inadequate and serious problems are faced because of this. If the funds are made adequate it is felt that the burden on the earnings of the specific concerns may prove a very great disadvantage in competition with the firms which do not have the systems. The author, therefore, raises the question as to whether industry must not turn to public or state pensions in order to obtain the advantage of being able to get rid of superannuated employes. A questionnaire recently sent out by the Society of Industrial Engineers showed that a little more than one-half of all the important employers answering it favored state as opposed to private pension systems. Of course, the advantages of the state system to the worker have been emphasized many times. It includes all the workers; it includes men who have to, or want to, transfer from one firm to another, and it somewhat minimizes the urge of the individual employer to discharge, or refrain from hiring, the man over forty who is going to prove a disproportionate burden on his own pension fund.

---

[4] Associate Editor, *The New Republic*, New York.

It seems to me that the report on "Recent Economic Changes" throws less light on the doctrine of high wages than on the other subjects it treats. The course of wages is one of the most uncertain things in the industrial future of the United States. I question whether a majority of ordinary employers, even in the United States, seriously accepts the doctrine of the economy of high wages. And I question further whether, if they did accept it, their individual action alone would be sufficient to put it into effect.

The doctrine itself is a rather vague thing. In its elementary form I believe no one would question it. It is simply that, as the power of the community to produce valuable goods advances, the wage earners should share in that advance. In order to share in it, their purchasing power must, of course, be increased. That is a social doctrine without any bearing on the business cycle, or any other technical economic problem, and seems to me beyond question.

There is a good deal of evidence in the report, as in other publications of the National Bureau of Economic Research, that the doctrine, as stated in a rather back-handed way to catch the attention of business men, has something to bear it out. We cannot keep up production unless consumption is adequately increased to absorb that production, and consumption cannot be increased unless the wage earners, who form such a large part of the public, have increased purchasing power.

It is true that wages and salaries form a far larger part of our national income than the income from property. And in the income from property are included, of course, the returns of more than six million farmers and small business men who are not engaged in manufacturing at all. This income of wage and salary earners is about 40 per cent larger than the income from property. It is not only the biggest, but one of the most stable, elements of national income and has been constantly growing for the past eight years. It is difficult to conceive how the increased production of American industry could have taken place if the purchasing power represented in this element of the national income had not increased as it has. And it is difficult to conceive how we go on increasing production, as we have the technical and managerial ability to do, unless such income increases correspondingly again during the next eight years. We could not distribute many of the products of American industry simply to those who receive profits, rent, interest and dividends. The question is: Is it going to happen? And if so, how?

That leads us to the question whether it has happened during the past eight years because employers adopted the policy of making it happen. This I doubt very much. In the first place there was no appreciable growth in the purchasing power of wages between 1913 and 1919. As a matter of fact the purchasing power of wages was somewhat less in the year 1919 than it had been in 1913. There were two or three years between when it had been higher, but throughout the period there was no growth. The big boost came between 1920 and 1923 when we had a great depression and a recovery from that depression. During the depression, through no desire on the part of business men, prices fell very rapidly indeed. Wages fell somewhat also, but they did not fall so rapidly as prices; that is, wage rates did not fall so rapidly. (There was, of course, a great deal of unemployment.) This was a perfectly natural thing both because wages are, in the nature of things, not so flexible as prices and because there was a great deal of active resistance to wage reductions on the part of organized labor. And employers feared to antagonize unorganized labor to the point where it would organize. There was also undoubtedly a great deal of reluctance on the part of employers to reduce wages any more than they had to. The result was that when full employment and a somewhat restricted labor market returned in 1923, with wage rates starting up also, the purchasing power of wage earners had been markedly increased. The major part of the increase was not the result of a conscious social policy on the part of anyone, with the possible exception of a few employers who did not reduce wages as much as they might and some labor unions which, more or less indiscriminately, opposed wage reductions.

Since 1923 we have had a still further, but relatively small, increase in the purchasing power of wages. According to the testimony of Dr. Wolman this has come about, in manufacturing, not through any general increase in wage rates, which have in many cases been cut, but through the very rapid increase in productivity. Those paid by the piece, or by results, have necessarily benefited by this increase in productivity. But the increase in wage earnings has nowhere paralleled the increase in the productivity of industry.

A comparatively rapid advance of wage rates in unionized trades has been another factor in bringing up the average of wages. In the building trades the unions are strong and have steadily built up money wages. They have been aided by the fact that construction has been very active. In the railroads, where workers are fairly well organized, the unions have also gained numerous advances in wage rates. The same is true in the men's clothing trade and in the printing industry. All these things have served to bring up the average, but in manufacturing industry in general, where organized labor is weak, parallel increases in purchasing power have not occurred.

One questions whether individual employers can bring about a desirable increase in the purchasing power of wages simply by raising wages because they believe general purchasing power should be maintained. An employer of large numbers of people with magnificent financial resources, like Mr. Ford, can perhaps do so because of the rapid falling off in his production costs. But it is not to the immediate economic interest of the ordinary employer to increase wages more rapidly than the market rate of advance. It is true that he will gain if the general purchasing power of labor increases, but it is not true that he will gain very much from the increased purchasing power of his own employes, who after all buy a very small percentage of his products. In the case of the individual employer, therefore, the immediate economic interest is opposed to the general interest.

Nor will engineering schemes of payment by results bring about the desired increase in purchasing power. These are built upon a base rate, with advances in pay as a result of increased productivity. The important thing for this discussion is the movement of the base rate, and we all know that that is set in relation to the general standard of wages throughout the community. There are no provisions for raising the base rate as the overall productivity of the nation grows. As a matter of fact when a new machine, or method or even the efforts of the workers themselves greatly enhance the possibilities of production, rates are customarily revised downward in order again to place them somewhere near the prevailing rates of the community.

I wonder if we do not need a strong organized labor movement in all those industries in which there are great possibilities of increased production, in order to insure proper advances in the purchasing power of the community.

There are other obstacles to increased purchasing power. Some industries are in economic difficulties and some are not making the necessary advances in productivity per man-hour. The bituminous coal industry, for instance, is over developed and suffering from cut-throat competition. The same is true of large sections of the cotton textile industry. Within every industry there are marginal plants which are, in their present state of management, incapable of paying higher wages and still remaining in business. If they go out of business the number of unemployed is temporarily increased and the factor of supply in the labor market tends to depress wages. Even the installation of improved machinery at least temporarily increases the supply of labor in any given craft or occupation, and has an immediate depressing effect on wages in that craft or occupation.

Even if all these backward industries could be adequately reorganized and brought in line with those at the head of the procession, there would still be further difficulties to meet if we expect increased purchasing power to be brought about by advances in money wages alone.

Under the best conditions, productivity will increase more rapidly in some industries than in others. It is quite inconceivable, however, that money wages should increase by 100 or 200 per cent in a few years in an industry that has made that advance in productivity, while they increased by only 1 or 2 per cent in an industry that had made only that advance in productivity. This is not the way things happen in a competitive economic world. In order to increase purchasing power we have to call into play that other factor in the equation—reduced prices. We must expect a large part of a steady increase in purchasing power to come about through a reduction in the prices of those many articles which can be produced more cheaply through improved technique. It would be very unfortunate if we had to rely on another 1921 to produce this result. It should be possible to produce it in an economic order which shows a much higher degree of equilibrium than in the post-war years, by merely scaling down prices on those products which can be produced more cheaply in larger quantities and which could secure much wider markets with lower prices. Competition tends to bring this about where it is adequate. Where monopolies exist, as they do in public utilities, we must count either on the good sense of the management of these industries or on our public regulating machinery to produce the result. The agencies of government, as well as of management and of organized labor, it is likely, will have to be called in to help in this process before we have achieved a right social technique.

There is still another thing that will have to happen before we score one hundred in the proper increase in purchasing power. Much better management of the investment of our productive capital is required than we have ever evinced before. A really balanced economic order would do something to discourage the investment of new capital and the expansion of productive facilities in those industries and trades which seem to be reaching the natural limits of their possible markets, no matter how low the price may go. While there may be no saturation point for the sale of goods in general, that is certainly not true of the products of individual industries. A really balanced economic order would facilitate the transfer of capital to new fields where rapid development might normally be expected.

There are, of course, other problems that will arise in the course of this endeavor, if we pursue it intelligently and with the real good of society in mind. I think I have said enough, however, to show that there is nothing automatic about this increase in popular purchasing power. It does not necessarily follow promptly and surely upon the increase in power to produce per man-hour. We cannot rely upon it to happen just as it has happened in the past eight years without some persistent attention being paid to it. Entirely aside from the prospects of the next few months, I think this is probably one of the greatest uncertainties in the economic future of the next decade or so.

Royal Meeker.[5] Two questions occurred to me as I listened to Mr. Soule's very able discussion. The first is whether organized labor has really done anything to change the distribution of the national income as between workers on the one hand and income receivers from other sources, such as property and management, on the other. I doubt it. I think the trade unions have been very effective in redistributing the wage income, but I do not think they have increased the total amount paid for wages. Between 1916 and 1920 it was unskilled, unorganized labor that received the greatest advance in wages. It was not the trade unions that secured the advance for them; it was the cutting off of immigration and the great increase in demand for unskilled labor that secured it. I think this matter of the redistribution of the total social income is largely dependent on forces outside the control of individual or organized employers or employes.

The other question is: Can prosperity prosper with falling prices? It never has been very prosperous under falling prices, though that does not prove absolutely that it cannot be so in the future. Mr. Soule was speaking of price reduction in special industries where cheapened costs of production make price reductions possible. This, of course, will go on. But such reductions in prices of specific articles like automobiles do not mean a lowered general price level. In general, I believe we should make our supply of currency keep up with our production in order that the general price level may remain steady. Stable prices make for stable production, stable employment and prosperous prosperity.

---

[5] Irving Fisher, New Haven, Conn.

Norman Lombard.[6] As Dr. Meeker said, prosperity has never been very prosperous in a period of falling prices. Following the Napoleonic Wars we had a period of falling prices which continued until the discovery of gold in 1848. During this period every life insurance company in the United States, except one, either failed or changed the nature of its business. Then we had a period of rising prices during which over three hundred new life insurance companies were formed. Following the Civil War we had a period of falling prices which continued until the discovery of the cyanide process and of new gold fields. During this period every railroad in the United States, with one exception, was reorganized and there were the greenback and free silver campaigns and other manifestations of social, economic, financial and political unrest. Then followed a period of rising prices and increased cost of living to 1920; then followed a most disastrous period of falling prices, with millions of men out of work.

I think the economic thought of the day is in favor of a stable general price level, which means a stable purchasing power of money. If the prices of certain products, which can be produced with increasing cheapness, are lowered, then there should be an increase somewhere else, so that the general price level will remain stable. If the price of one product goes down, that means, provided the volume of money remains the same, that money will be freed to purchase other things, and these other things will be increased in price by the new demand. A depression in the one spot will be compensated for by a rise in some other.

H. V. R. Scheel.[7] It seems to me that there is another factor in the equalizing process just referred to. Money freed by lower prices may go into the purchase of more goods at the lower prices instead of into the purchase of other products at higher prices.

And there should be some mention made of the psychological aspects of the problem. There is a class of people that does not change its buying habits easily in response to changes in wages and prices. Savings may be considered potential purchasing power, and influences, such as advertising, that affect the habits of people are important.

Edward Eyre Hunt, Chairman.[8] I think one of the most interesting outcomes of the "Report of the Committee on Recent Economic Changes" is just this type of meeting. There has been an extraordinary amount of public interest shown in the report. In spite of its miscellaneous character and the fact that it is published in two volumes and sells for seven dollars and a half—a formidable price—it is already in its third printing, and an abridgment of 50,000 words is to come out about the first of February. Almost every time there has been any public discussion of economic changes since the report appeared it has been mentioned. We might almost be misled into believing that economics has become news in the United States!

Of course it is no news to the Taylor Society, which devoted a session to the "Report on Waste in Industry" in 1921, and is now only following its own fine tradition in discussing the "Report of the Committee on Recent Economic Changes" in 1929.

In connection with the doctrine of high wages which has been discussed here, I should like to say that summaries are prepared each day for President Hoover showing the editorial comment on any matter which is interesting to the White House. He is now getting not only these summaries but the actual editorials from more than a thousand newspapers. Nothing in the recent White House conferences has caused so much favorable editorial comment as the President's efforts to maintain wages and purchasing power. To me, at least, this has been a revelation of the change in the public attitude toward a vital subject. After the World War, when the best economic brains were mobilized in Washington, one of the foremost economists of the country was called upon for advice. The first thing that he proposed was a wage cut. That was current economic doctrine at the end of the World War. When the Conference on Unemployment was called in 1921, the first thing which Mr. Hoover tried to do, through that conference, was to maintain wages. And of course the first thing which the

---

[6] Stable Money Association, New York.

[7] Vice President, Botany Consolidated Mills, Inc., New York.

[8] Secretary, President's Conference on Unemployment, Washington, D. C.

President did when he brought the leaders of American industry together in November, 1929, was to get a unanimous agreement from the employers represented that they were going to maintain wages. These three incidents are, I think, worth remembering in connection with the current doctrine of high wages.

I should like to bring the meeting to a close by trying to trace the evolution of an idea which has not been stressed in this discussion, namely, unemployment. The study on "Recent Economic Changes" grew out of the President's Conference on Unemployment, and it is not the first which has its roots in that conference. The primary moral purpose of the recent study, in contrast to its purely economic purpose, is a reduction of unemployment. To get its background we have to go back at least as far as the report on "Waste in Industry" in 1921. That report, in discussing the primary wastes in industry, said that the greatest wastes are human, and listed unemployment as a major waste in our economic system. The greater part of the work on the report on "Waste in Industry" happened to be done in the period before there was any substantial margin of unemployment. In that respect it set the pattern for the latest of these reports, the one on "Recent Economic Changes." Yet both found a large margin of unemployment, even in the best of times, and pointed to it as one of the fundamental weaknesses of our economic system.

Following the report on "Waste in Industry" came the Conference on Unemployment in September and October, 1921, and following that came the analysis of "Business Cycles and Unemployment" in 1923. Then followed "Seasonal Operation in the Construction Industries," a study of seasonal unemployment in 1924. The study of "Recent Economic Changes" is an analysis of the prosperous period since the recovery from the depression of 1920 and 1921. I think these committees and conferences have done us a real service in taking unemployment as their major problem. We might add this topic to the list which Mr. Burgess presented in his very able paper. Among the matters of primary interest to business managers should be a definite assumption of responsibility for employment and an exploration of ways and means to stabilize it. On this note I close the meeting.

(A record of the complete discussion is on file in the office of the Taylor Society for any who may wish to consult it.)

Resolution of the Taylor Society

On December 5 there assembled in Washington a National Business Survey Conference of industrial leaders summoned by President Hoover to consider problems created by the recent collapse in the stock market. Inspired by the discussions at its meeting, the Taylor Society on the same day adopted the following resolution:

WHEREAS, the President of the United States has called a conference of business leaders for the purpose of making plans to promote business stability and prevent unemployment;

BE IT RESOLVED, by the members of the Taylor Society in annual meeting assembled, that the following recommendations be forwarded to the President's Conference:

FIRST: Since a fundamental factor essential to industrial equilibrium and prosperity is the prevention of wide fluctuations in the general level of commodity prices, we recommend that the Conference express its appreciation of the actions already taken by the Federal Reserve System to this end, and that the Conference recommend to the Federal Reserve Board that, as a means of reassuring business, they make open avowal of their intention to observe this policy in the future, so far as possible.

SECOND: Since the government is in possession of much valuable data, contained in the archives of the Treasury Department, the Department of Commerce and elsewhere, which would be of inestimable value to business, if analyzed and summarized and the results made public, we recommend that the Conference propose a plan whereby this information shall be made available to business in such form as not to violate the confidential character of the constituent data.

THIRD: Since many industries are suffering from unbalanced production and other maladjustments which are harmful to all concerned, including capital and labor, producers and consumers; and since the Department of Commerce, through the Bureau of Standards and the Division of Simplified Practice, has already pointed the way to a form of co-ordination within each industry which preserves to the public the benefits of competition; we recommend that the Conference evolve plans whereby such co-ordination may be extended into other fields and phases of business and industry.

Carl G. Barth on Scientific Management[1]

Testimony Before the Special Committee of the House of Representatives, January 31 and February 1, 1912

(Continued from the October number)

Testimony of Carl G. Barth

February 1, 1912

The Chairman: You may proceed, Mr. Barth.

Mr. Barth: I would like to give some more examples of deliberate soldiering in the shops. During my engagement with Wm. Sellers & Co. years ago they had for a number of years a Scotchman in charge of a large repair gang. The general system of management in vogue at the time allowed this man a great deal of freedom in the handling of his gang, and for years he was a trusted employee, and no great tab was kept on the manner in which he utilized his men. However, it was common knowledge for years in the shop that this whole gang were systematic loafers. They adopted a systematic plan of hiding away in various parts of the shop when they had nothing to do in order still to retain their positions. However, the game was finally discovered and the whole bunch discharged. Right in the drafting room of Wm. Sellers & Co. I also had a personal experience in being prevailed on by a fellow draftsman to slow down my gait of drafting, and because I did not slow down what to me was a natural gait—I was working like a beaver from the moment I got into the office until I left, regardless of my pay—I had a black eye with the man and his sympathizers for a good long time.

I also found out through the various Norwegian friends of mine who worked in the shops at Wm. Sellers & Co.'s about the conditions that existed as regards piece rates. I know again and again the men told me that they could make without the slightest difficulty half again more than the $5 a day, which they considered the limit of what they dared to do. Another game was when they had certain jobs that had been cut from time to time, because certain men had worked too hard at times, they themselves covered the defect up to their own detriment by taking time from the fat jobs and putting it on the lean, instead of, what should have been done, to lay the facts before the management and have the jobs evened up. This lack of confidence was absolutely natural under the old condition of affairs.

A few months ago I was invited to look over the shops of the Sharpless Separator Co. in West Chester, Pa., and there met in the person of the president, Mr. Sharpless, a most delightful man, from the fact that he had worked his way up from an ordinary machinist to his present position as owner and manager of a highly successful plant. He told me that about 1881, or the year that I first came to Wm. Sellers & Co., he worked in the shops of the James Moore Iron Works, in the next block to Sellers, and there put in the most miserable year he ever had in his life, for the reason that he was full of life and energy and loved to work, but was hounded by his fellow workmen because he worked faster than they considered it policy to do. I have also heard from other sources that that particular shop was one of the greatest loafing places the world has ever seen. In spite of that profits were so easily made in those days that James Moore died a rich man.

It was also interesting to have Mr. Sharpless tell me that he went from there to the Buckeye Engine Co. in Salem, Ohio, where he found an absolutely opposite condition. He could not tell me what particular kind of management they had, but there existed the kindest and most confidential feelings between the management and the employees, and he did not come across a man there who did not work hard in the interests of the company.

---

[1] Reprint of public document *Hearings Before Special Committee of the House of Representatives to Investigate the Taylor and Other Systems of Shop Management Under Authority of H. R.* 90, Washington, Government Printing Office, 1912; Vol. III, pp. 1538-1583. The members of the Committee were Hon. William B. Wilson, Pennsylvania, Chairman; Hon. William C. Redfield, New York; Hon. John Q. Tilson, Connecticut.

I would like to relate something more about the conditions found at the Yale & Towne Manufacturing Co. in regard to their old piece rates. We found there fat rates and lean rates, and the foreman giving as many fat rates to his friends as he could and the lean ones to those he did not like; and when some of the rates were so lean, due to reasons that I will further explain, that the man could not make his ordinary day's wages, day wages were by necessity given him under the rules of the company. One of the reasons why some of these rates were so lean was that they had been made in more prosperous times, when the number of pieces in a manufactured lot was larger. The time per piece obtained by the so-called trial men when the lots were large and the setting-up time a comparatively small part of the time for each piece was not sufficient, when the number of pieces to be produced was small and the setting-up time as a consequence became an appreciable part of the time for each piece. This had not been recognized, and the rates that had been pretty fair at one time were exceedingly unfair under the conditions that existed when I came there.

Now, by our method of careful study, we distinguish absolutely between the time of preparation and the time required for each piece after everything is prepared; and, whether we make a thousand pieces or one, a man has his allowance for setting up, and so he has exactly the same task and the same chance of making extra money, as far as is within our ability to see to it, in the one case as in the other.

Under our system the entire loss for running uneconomical lots through a shop falls on the management, and never on the men. That is a very important point, for those things are not so under the old style of management. They merely have a rate per piece, regardless of the number of pieces in a lot. Besides the injustice to the men the whole scheme deceives the management, who is paying day rates right along for such lean jobs, and still believe that they have the piece rate in operation. Besides, under some methods of keeping cost, this makes the cost returns misleading.

Mr. Redfield: I am interested in what you say about the keeping of costs. What do you mean when you say the system of keeping costs is misleading, and why, and how?

Mr. Barth: Because in a shop that produces a good many pieces of the same kind, as a rule, they do not keep the kind of costs that we prefer, which is to get the cost on each lot, and have each lot share its proportion of the overhead burden, so that every penny spent by the company in any fashion whatsoever toward production is shared by the various products in some way or other.

Mr. Redfield: You are speaking now of the method which you do not approve. In that method which you spoke of as a bad method of keeping costs, you say it is bad because the separate cost of each lot is not kept together with the proper proportion of the burden charge distributed over each particular lot; is that right?

Mr. Barth: Yes, sir.

Mr. Redfield: Have you anything more to say on that subject before you tell us what the proper method is?

Mr. Barth: Yes; at Yale & Towne the labor cost of an article was made up by taking the sum total of piece rates for all the operations on an article, and hence this cost did not represent the actual cost when several of these operations were done on day wages. Further, as they distributed their factory burden on the direct-labor cost only, the total factory cost thus obtained became increasingly lower than the actual cost.

Mr. Redfield: The proper method is that the cost of each separate lot is kept, and over each is distributed the due proportion of all the burden charges?

Mr. Barth: Yes, sir.

Mr. Redfield: So that it comes from the cost accounting department to the manager, showing its due proportion of material charge, labor charge, and burden charge?

Mr. Barth: Yes, sir; or analyzed into all of these.

Mr. Redfield: Now, how is the burden charge ascertained?

The Chairman: I like to ask, do you think it is possible to devise methods of keeping costs accurately?

Mr. Barth: No, absolutely no; there is no such thing as accurate cost; but there is a way of keeping costs so that every penny you spend is accounted for absolutely on the product you have for sale.

Mr. Redfield: What would it cost to do that?

Mr. Barth: Not very much more than the usual way of keeping costs superficially; but it does cost a great deal to get it going.

Mr. Redfield: Tell us about it.

The Chairman: May I ask this question? Are there any such cost-sheet methods in existence now?

Mr. Barth: Most assuredly; they are the only ones we advocate.

Mr. Redfield: I wish you would tell us what the proper way would be. Your criticism applies so far only to the labor charge, and it is obviously a good criticism on that. How was the burden charge ascertained at Yale & Towne?

Mr. Barth: I can only tell you that when I came there they did not include depreciation, taxes, and insurance, which they withdrew from what they considered their gross profits at the end of the year, to leave the net profits for the year; but after I had been in touch with them for awhile, their treasurer, who had charge of costs, the following year came out with a new way of keeping costs which did prorate those charges as part of the overhead burden per month.

The Chairman: Would not the burden charges vary at various seasons of the year on the same products, in accordance with the state of trade and the amount of business the shop had to turn out?

Mr. Barth: Most assuredly; it varies all the time.

Mr. Redfield: Is it not a fact that the burden charge not only varied, as the chairman has said, but was different for each separate department of the work?

Mr. Barth: Absolutely; Yale & Towne knew all about that.

Mr. Redfield: How did they apportion it?

Mr. Barth: I did not go very deeply into their methods of cost keeping, only I found that there was a great deal of good in them.

Mr. Redfield: Do you know how they apportioned the varying ratios of burden cost to the respective departments?

Mr. Barth: Not absolutely in detail. I can tell you how we do it.

Mr. Redfield: Tell us briefly how you do that.

Mr. Barth: The world has been looking for a hundred years for costs, and it is too big a subject to make very brief.

Mr. Redfield: Tell us as briefly as you can how to apportion the burden charge over the different departments, in their proper ratios.

Mr. Barth: Broadly speaking there is no such thing as a proper way, because no matter what you do, you must compromise a great deal, and it therefore becomes to a great extent a question of judgment, which is the better of a thousand ways which may suggest themselves, and which have been suggested. But after having studied thoroughly for years the methods adopted and advocated by Mr. Taylor, I have been unable to agree with those who disagree with him, although a great many very valid criticisms of the methods have been found, and will constantly be found; so much so that it would be absolutely foolish to say that it would be wise to apply them unmodified to all classes of manufactures and under all conditions; but they are the ones seriously to consider before anybody makes up his mind to do anything else.

One of the fundamental principles of Mr. Taylor's system of cost keeping is that every penny of expense incurred during any period of production should be saddled upon the product produced during the same period. How this is carried out would best be elucidated by taking a concrete case. Suppose there is a factory that sells its own product, and it is considered desirable separately to keep track, as far as possible, of what some people call commercial expense.

Mr. Redfield: You mean selling expense, in addition to the burden cost in the factory?

Mr. Barth: Yes. That is a good way to put it. I like also to mention that, as but few salesmen can be made to understand how costs are made up, and the necessity for what appears to them extravagantly high burden factors of one kind or another, we considered it expedient to so keep the cost that the salesman knows nothing about how this is made up, but merely gets the statement that the cost of a certain article is so much; so that if he sells that article for 1 cent less the company has lost 1 cent.

Mr. Redfield: Tell us how you arrive at this cost.

Mr. Barth: We divide our sum total of overhead expenses or burden into at least four groups. These are:

1. The auxiliary shop expense.
2. The shop expense proper.
3. General operating expense.
4. Selling or commercial expense.

Mr. Redfield: Do these four items comprise your burden charge?

Mr. Barth: Yes. Under auxiliary shop expense come all such expenses as is incurred in what we call the auxiliary departments, such as the heat, light, and power department, the planning department, the storeroom, etc., which work for the benefit of all productive departments without themselves directly contributing anything to the product. In it is also included a great many expenses of various kinds, which, while they are not incurred in any of the several auxiliary departments, they are, at least, in somebody's judgment, of the same nature, namely, such that they should be shared in some proportion or other by the various productive departments. Added to these come also the monthly prorating of such expenses as depreciation, taxes, insurance, bad debts, perhaps, and so forth.

By direct shop expense we understand the sum total of all expenses incurred in each of the various productive departments, such as repairs and maintenance of machinery, keeping each shop clean, and all material that is used in these departments in any way whatsoever, when the same can not be charged to any special production order. Also all foremanship and clerical help and labor of any kind that contributes to the turning out of the product in a particular shop, without being directly chargeable to any particular production order.

However, each productive department has its own direct shop expense, when it comes to its cost distribution.

Under general operating expense we include the sum total of expenses incurred in all such departments as are more in the nature of general business departments without dealing with the selling end of the business, such as the purchasing department, the general manager's office, including all help, stenographers, clerks, and so forth; also certain of the expenses incurred by men in the planning department whose work has no direct bearing upon the amount of goods produced; for instance, the man who keeps the pay roll, which is apart from cost, and all personal records of employees for any purpose whatsoever. This is for the reason that this general operating expense is proportioned on direct wages, by which I mean wages paid actual workers when engaged on some specific productive work. We positively avoid the term "productive wages.'"

Mr. Redfield: Now we have a fourth department?

Mr. Barth: The fourth expense, the selling or commercial expense, pretty well explains itself. It includes every expense incurred by the company for the purpose of making a market for the goods and inducing customers to take them off their hands.

Mr. Redfield: Let me ask you a few questions, and we will go on. You have now three large elements in cost; material cost is one, labor cost is another, burden cost is another; and of these the burden cost is divided into four heads of which you have spoken. The aggregate of these three groups when apportioned to the actual productive orders for a given period makes the closest approximation we know to the actual cost of the goods?

Mr. Barth: Yes; for that period.

Mr. Redfield: That is what we are talking about. Is it not the fact, as your experience in various factories has shown, that the total burden cost is sometimes as great as the combined labor and material cost?

Mr. Barth: Frequently far more.

Mr. Redfield: Is it not the fact that the actual productive labor per unit in that period and for that quantity is often a minor element in the cost?

Mr. Barth: Perfectly true.

Mr. Redfield: Is it not the fact that the material cost per unit for the lot in that period is often as much as or larger than the labor cost?

Mr. Barth: As much as or larger? Very frequently it is a bigger part; sometimes a minor.

Mr. Redfield: Is it not a fact, therefore, that often in that period and for that lot the unit cost of labor is the smallest element in cost?

Mr. Barth: Perfectly true.

Mr. Redfield: And is it not apt to be so just in proportion as the management is wise and as it is accurate in setting this burden cost?

Mr. Barth: Perfectly true. While I have been intensely interested in my work as an engineer I have become far more fascinated with the cost and accounting side of a business, just because of the many ways in which this may be looked upon and handled, or rather mishandled.

Mr. Redfield: Is it your experience that in the shops you have visited manufacturers know, as a rule, with reasonable accuracy what their goods are costing them?

Mr. Barth: That is absolutely not true, in a great many of them.

Mr. Redfield: Is it or is it not the fact that in your experience the burden charge is commonly underestimated?

Mr. Barth: Yes.

Mr. Redfield: Is it or is it not true, in your experience, that the labor cost per unit and the effect of the rate of wages upon labor cost is commonly overestimated?

Mr. Barth: Absolutely. All some managements can see in cost is the size of the pay roll at the end of the week. One of the curses of the present way of doing business by a number of incompetent managers is that, because they do not know how to keep cost, they believe, for a limited time, that they are making money—believe they are making money, when in reality they are losing, and by their low selling prices drive competition to a point far beyond its legitimate limit. I know a company that has struggled for years and years against such competition, and only because of its excellent management has been able to keep its head above water. Their business has appeared to be one with very large and promising returns, and for this reason a number of concerns have been induced to go into competition with them; and while these, one after the other, have gone down in the attempt, they have, while they lasted, caused the company I have in mind a great deal of illegitimate trouble.

Mr. Redfield: What have you to say further as regards the effect of the Taylor system of scientific management upon workmen in shops? Have you any more instances you can relate?

Mr. Barth: Yes, sir. I have certain things I want to say. The fear has been expressed that through our so-called system of scientific management we make automatons of the workmen. The fact about that is that, in my experience and judgment, we produce far fewer, for the reason that the management itself keeps so closely in touch with what is going on that they more readily see the inhumanity of making automatons of human beings. I do not recollect that in all the 13 years that I have been connected with Mr. Taylor's work I have come across a single case as bad as one I found in the shop I told about, where a man was running a planer without a cut, and pretending to work; namely, that of an old man driving little bits of rivets in certain parts of platform scales, which had been his only work for 42 years past. I do not believe that this would have existed under scientific management.

Mr. Redfield: Where was that?

Mr. Barth: At the Fairbanks Co. The man had been doing the same thing for 42 years.

The Chairman: What relief would scientific management have given him?

Mr. Barth: We would probably have invented a machine to do that thing long ago, in a much better fashion. The man would have learned to handle that machine instead of using his own hands and arms to work that hammer up and down.

The Chairman: What would scientific management have done for him if you had been unable to invent your machine?

Mr. Barth: We would probably have distributed that work, at least I should judge we would have had men taking turns at it, along the principles laid down long ago by Mr. Bellamy in his wonderful book "Looking Backward," in which he suggests that the time will come when all disagreeable labor in this world will be divided equally between all able-bodied men, so that a certain number of days out of every man's natural life will be spent in performing that service to the world.

Mr. Redfield: Give us some more illustrations.

The Chairman: Just a moment before you get away from that Bellamy proposition. Do you not think it is more important for mankind generally that we should solve the problem of the distribution of that which is produced rather than developing any method by which production would be increased through increased expenditure of energy?

Mr. Barth: I myself believe that no stone should be left unturned to find a solution for the unsolved problem of distribution, but that does not in any way interfere with the problem of making normal human beings of all workmen by keeping them employed at a natural, normal gait during the hours in which they are, nominally at least, at work.

The Chairman: Under your system, who is to be the judge of what constitutes a normal gait for each particular workman?

Mr. Barth: That is, as Mr. Taylor has said, again the question of careful scientific study.

The Chairman: With the ultimate judgment in the hands of the person who makes the study?

Mr. Barth: No sir; in the hands of anybody who has knowledge and intelligence enough to bring to bear upon the subject.

The Chairman: Who is to decide who has knowledge enough and who has not knowledge enough?

Mr. Barth: When it comes to the real question of facts of that kind they are very easily ascertained.

The Chairman: Who can determine the fact of what is the normal condition of exertion or the normal amount of exertion on the part of any man, outside of the man himself?

Mr. Barth: Nobody would be a better judge than a man himself if every man could be depended on to be absolutely honest about the matter; and so he would if he was taught the truth that it would be to his ultimate interest and to the interest of the world at large to absolutely tell the truth about it.

The Chairman: Do you mean to convey the impression that an employer, or the representative of the employer making a study of what should constitute the normal condition of a man, would be any more honest in his conclusions in regard to the normal conditions than the man himself?

Mr. Barth: Not at all. For the very reason that the man has had every chance in the world to give his opinion and he has usually failed in every instance.

The Chairman: It is not so much the question of who can give opinions, but a question of where the ultimate authority rests to determine what the normal condition is.

Mr. Barth: Mr. Chairman, this is, of course, like all scientific problems outside of the few exact sciences—a hair-splitting solution of the problem is impossible, but a practical solution is possible.

The Chairman: It is a very important factor in the entire relationship between an employer and an employee as to whether the final authority in determining the relation between the two shall rest with one or the other, or with both jointly.

Mr. Barth: With us it rests with both jointly.

The Chairman: In case of dispute between the two, who settles it.

Mr. Barth: We shall wait until the dispute arises. It has never arisen with me personally in these 13 years.

The Chairman: Now, in working out your theory, where do you rest the authority when a dispute arises?

Mr. Barth: A dispute as to this has never gotten so far that a serious decision of that kind has been necessary.

The Chairman: Has not that been true because of the fact that your entire policy is based upon the management dealing with the employees individually?

Mr. Barth: That I dare not say. I have personally had no trouble and I am not looking for trouble and shall wait until it comes my way. My trouble in introducing the system has been entirely confined to the foremen and the management themselves. Any little trouble I had had with the workmen have vanished just as soon as they have arisen.

The Chairman: I am perfectly satisfied, Mr. Barth, to let anyone who reads this statement take that kind of a reply to my question.

Mr. Redfield: I do not think, Mr. Barth, that your answer is a responsive one. I think you should answer the chairman's question more specifically.

Mr. Barth: Will you read the question again?

The reporter repeated the question, as follows:

> The Chairman: Has not that been true because of the fact that your entire policy is based upon the management dealing with the employees individually?

Mr. Barth: I can not say. When I have had no trouble of that sort I can not give any specific reason why I did not have trouble. I can only state the fact that I have had no trouble from that source. But as I now realize that the chairman's idea is that, under those conditions, cases may arise where the stronger hand of the management would have a great deal to do with a potential trouble not coming to the surface and that his idea is that unless the employee feels that he has behind him as strong a hand as that which can be wielded by the management, the real fact may not come to the front; and as I see that his idea is that unions, or their equivalents, should be that counterpoise to what is ordinarily considered the manager's stronger hand I, myself, would be delighted to deal with an organization of fairminded men that will look all the facts square in the face, for the more competent judges we can get the better I shall certainly feel.

The Chairman: Is it not true that the general policy of your entire system is to lay down the system and say this is right; now, if you are willing to agree to this system we will deal with you; if you are not willing to agree with this system we will not deal with you? Would that not be an unfair proposition in the first place, and the assumption of superiority on the part of the management?

Mr. Barth: That may be partly true, but in one sense it is absolutely not true. The way business is conducted to-day there can be no other way than that the management lays down the general policy. For instance, I do not think that anybody to-day could find exception with the management for either wanting to introduce a system like ours or for not wanting to. I do not think that we could go to work and at the same time canvass the employees to ascertain what their wishes would be in the matter, as it would be impossible at the present state, when the system is so absolutely misunderstood, not only by most workmen but even by most managers, to get an expression of opinion that would be worth anything whatsoever; and for this reason the general policy of management must still be vested in the management.

The Chairman: If the general policy of management must be vested in the managers, and the application of that policy in any manner affect the workman, is it not entirely wrong to have absolute and final power vested in the hands of the management, so as to apply to those workers individually?

Mr. Barth: On that score I used to feel and think a great deal, as a younger man. I keenly felt, and still feel, the injustice of the present order of society. I have suffered much because I have expressed opinions against it to people who are satisfied with things as they are. I have arrived at the conclusion, however, that whatever general conditions exist at any one period of the world's history is, in the main, part of a natural development which can not readily be changed into anything better except through further slow and painful development of each individual rather than of the development of society as a whole.

And I will not hesitate to tell you that the only religious belief I have, the only faith I have, is that some time this world will develop, helped a little through the efforts of men who feel like you and I do, so that all men will be more nearly equal in every way, physically, mentally, and morally, and that that is the only heaven that humanity can ever look for.

I have learned to look upon myself as one of the little bricks in the building up of the future grand humanity, and I want to try to be as good a brick as I can with my limited abilities and opportunities; and in my present work I believe that I have found a little niche in the world that I can fill, not only without detriment to anybody, but even with some beneficial influence on my immediate surroundings. I am a product of these surroundings; and I have to work in these surroundings as I find them; and I do not see how I can work as an engineer without accepting the proposition, the ordinarily accepted theory, that the manager or the owner of a business has a right to lay out the general policies; because, as a rule, he is a broader man than the men who work for him, and because as an individual he has more at stake, as things are now constituted.

I am very much concerned that the statesman, as his enormous task in the world, shall eventually find a solution for the present wrong order of society, and as one part of that solution the proper distribution of all wealth produced. But I do not consider that it is given me to become a statesman and meddle with those affairs, so I have resigned myself to my fate of doing my share of the world's work as an engineer, whose business it is to do all he can to produce wealth without in any way oppressing any individual or class of individuals, but, on the other hand, to do it along so broad-minded lines that he helps men to develop, so far as possible, into the highest type of normal human beings.

One of the requisites for this is, it appears to me, that a man who works for somebody else is honest both with himself, his employers, and his general surroundings, as regards what he does and can do.

The Chairman: Now, assuming that this scientific management, or the Taylor system, in all its phases, with the exception of those phases that induce a greater expenditure on the part of the workman, are introduced, would you not thus have added to the productivity of the man?

Mr. Barth: Yes.

The Chairman: Having added to the productivity of the man by introducing these methods, and added to the productivity without any increased energy on the part of the man, and with the knowledge that the man's productivity is 20 times greater than it was 150 years ago, as stated here the other day, what social or economic necessity is there for introducing into these systems anything that increases the expenditure of energy on the part of the workman?

Mr. Barth: As regards the expenditure of increased energy on the part of the workmen, we all know that a certain amount of expenditure of energy is absolutely necessary for the normal growth of individuals. We cannot grow into healthy human beings without expending a certain amount of energy every 24 hours, with occasional rests between, which will not be hurtful. However, this is not the case when a man lets on as if he is working when he is not or when he runs his machine at a lower rate than he himself knows that it may be run or a lower rate than we so often can show him how to run it.

I believe that men frequently spend more all-around energy in letting on as if they are working hard when in reality they are doing but little, and this is certainly energy of a most deplorably wasteful kind.

The Chairman: Admitting, for the sake of illustration, that continuous work, uninterruptedly, would be beneficial to the productive capacity of mankind, are there not other phases of man's nature that can be benefited by occasional rest from the grind of production?

Mr. Barth: Surely; but I believe that it would be much better if these interruptions were only daily and not by days, weeks, or months, as so many people want them.

The Chairman: Would that not be better from the standpoint of production and not from the standpoint of the comfort or pleasure or happiness of the man?

Mr. Barth: Personally I do not believe so. I find myself far happier when I have enough recreation every day and work every day, including Sunday, for which I make no distinction from the rest of the week, and never shall.

Mr. Redfield: Mr. Barth, is it or is it not the fact that in your system, so far as the man is concerned, you aim to cut out useless and wasted motions?

Mr. Barth: Absolutely.

Mr. Redfield: Is it a fact, and if so, can you say to what extent, that in so doing your aim is to teach the man to do the same or a greater amount of productive work with a smaller expenditure of energy?

Mr. Barth: Either a greater production with the same energy or the same production with less.

Mr. Redfield: The same production with less energy?

Mr. Barth: Yes, sir.

Mr. Redfield: To what extent is it true, if it is true at all, that your system does call for a greater outlay of energy on the part of the worker?

Mr. Barth: I can not say very much on that subject, because my part in the whole scheme has grown bigger than, as a rule, to deal with individual cases, and I now principally have to confine myself to lay down the law to those who deal directly with the workmen. It is only a comparatively short time I can remain with a concern after they get far enough along to get time study going, and that is turned over to other men. But these are instructed by me along the lines of never overworking anybody; and if any case arises where there is any doubt, that the man shall have the benefit of that doubt.

The Chairman: If there is no desire on the part of scientific management to have increased expenditure of energy, why the continual protest against the loafing and soldiering which existed under the old conditions and which, you contend, are eliminated under the new conditions?

Mr. Barth: We certainly want increased expenditure of energy where previously there was none, or we want to change nonproductive energy into productive energy.

The Chairman: There have been statements made here of soldiering and about the elimination of soldiering under the new system. If the new system eliminates soldiering, would not that of itself require greater expenditure of energy on the part of the man who had been soldiering?

Mr. Barth: Most assuredly.

The Chairman: Who is to determine what is soldiering and what is not soldiering?

Mr. Barth: I think we have already settled that.

The Chairman: Who has decided?

Mr. Barth: We have already talked a great deal about it.

The Chairman: Who is to decide under your new system, and who decides under the old system.

Mr. Barth: That is mutually agreed upon between the time setter and the man working.

The Chairman: Is it not, as a matter of fact, a question of judgment on the part of somebody as to whether somebody else is soldiering, or is not soldiering, in many instances where soldiering is said to exist?

Mr. Barth: I dare say because I have not been able to watch every case in this world. I have only personally observed an infinitesimal fraction of soldiering done in the world. I have preferably never set out hunting for it.

The Chairman: And that was your judgment, that soldiering existed, that these men were soldiering?

Mr. Barth: Most assuredly. And when you bring the facts before them they will not deny it.

The Chairman: Under your system is it not recognized that different men have different capacities?

Mr. Barth: Most assuredly.

The Chairman: Then how are you to determine, as an individual, whether or not the other individual, simply by observation, whether the individual is soldiering or is not soldiering?

Mr. Barth: Merely by bringing my impression to the attention of the individual and having him admit it. That is the only sure proof.

Mr. Tilson: In your experience, Mr. Barth, how general is soldiering?

Mr. Barth: That depends on a great many circumstances. There are some shops where there is very little of it. There are more shops in which I do not suppose, if we hunted for it, we might find a case in a day. The most substantial improvements we have made have been by reducing motions and improving machinery. I never go into a shop with the idea of unearthing loafing at all. I only go, regardless of what has existed, to introduce our way of handling matters.

The Chairman: Is it not true that under the old system of management a man's desire to hold his job is, in itself, a safeguard against any great amount of soldiering?

Mr. Barth: Certainly, and that is the reason that the thing is so demoralizing, because he dare not do it openly, but it must be done like a sneak thief; he deliberately steals his employer's time that he is paid for. We never find much fault with the man who is found loafing and stands up as a man and admits it.

Mr. Tilson: Do you frequently find men soldiering who admit it?

Mr. Barth: There is not much trouble about that. I have no trouble getting a man to admit anything he does that is wrong.

Mr. Tilson: Have you found it in cases where piecework is the rule as well where daywork is the rule?

Mr. Barth: In piecework shops I can not now call to mind a specific instance where I have personally seen a man loafing, but the study of the jobs made has made it absolutely evident that he must have been, and we have frequently had no trouble whatsoever to get a man to admit that such has been the case; and we find no fault with him, because we know that under the old system of management he would simply have been cut in the price per piece the minute he put forth efforts to utilize his time properly.

The Chairman: What guarantee has the workman got that his price would not be cut under the new system if he put forth an additional amount of energy?

Mr. Barth: Nothing more than that it is one of our essential conditions for going into a shop. We make the management understand that that is what we stand for, and that that is what they must stand for. One human being can not guarantee another human being. I can never feel sure that after I work hard on the manager and men that what I have established will not rattle down in the course of time. Progress sometimes goes backward for awhile, but never in the long run.

As a further example of human beings being made automatons under the old system just as much as they may under the new, in spite of all efforts to avoid it, I like to cite the case of a number of women I saw feeding the printing presses in the Public Printing Office of the Government the other day. I can imagine no more automatic work than to sit in an awkward position, as some of them did, and shove pieces of paper up against two stops at right angles to each other to get the proper registration of the paper in the machine. I am exceedingly happy, however, to know that great strides have been made in the way of inventing self-feeders for this kind of machines. They are entirely successful when only one color is printed, but up to date, so far as I know, have not been successful when more than one color is to be printed, because then the registration has to be so nearly perfect that the mechanism invented to date has not been able to produce the required accuracy with certainty.

I would like to cite the case of two men that for some reason or other quit some years ago. Both men left Link Belt Engineering Co. after the system had been in operation for some time, but before

I got through there they returned.

The one man operated a large boring machine, and he told me that, while working at the Southwark Foundry in the same city, he had been unable to stand the disagreeableness of hanging around the tool room, often as long as an hour at a time, waiting for a boring cutter that at the Link Belt Engineering Co. would either be furnished him with the job, or which he could send for in a few minutes through a boy on the floor. He said his manliness would not permit him to stand for those things after he had seen something better.

The other man had gone to the Standard Roller Bearing Co.'s shops to work on a drill press. He told me it was impossible for him to stand the fact that every drill press in the shop was far underspeeded—that even so the other drill-press hands did not run as fast as they could, and that he himself could not do a fraction of the work that he knew could be done, doing the best his drill-press would permit him. His sense of manliness had been so developed under our system that he could no longer be happy in the conditions he found on the outside.

Under the old system they sometimes adopt what they call the contract system of paying or dealing with the men, which means that rates are given to a contractor, and that he hires the men at the wages he sees fit, with no limitations on the profits he may make on his men. Only a few days ago a former contractor told me that he never made less than $1 to $1.50 per day on each man working for him, money which he now admits belonged to the men, and the greater part of which would go to the men under a management like ours, in which we do not tolerate any middlemen to divide in the premiums or bonuses.

I would also like to say that on my last trip to Watertown, where the strike occurred in the foundry because the great mistake was made of starting a time study without the customary preparation, I, for the first time, met Mr. Cooney, who is one of those, as I understand it, who was principally instrumental in bringing the strike on. The time-study man was exceedingly anxious that I should meet Mr. Cooney and see what a fine man he is, and what an exceedingly hard worker he is. I took great delight in making Mr. Cooney's acquaintance, and commented on the good reputation he enjoyed all around; and after a while I said: "Mr. Cooney, I guess by this time you realize that we are not as bad as you thought we were, and that our efforts are to help you instead of hurting you." He said, "Mr. Barth, our concern is not for the present. As things go now, here, nothing could be nicer; our concern is for the future." I said, "Mr. Cooney, I do not believe you need to have any anxiety for the future; at least we are working for the future more than for the present." He then told me that he could not altogether see through this scheme of ours, because he was not producing any more than he used to, and still he was getting a great deal more money. I said, "Mr. Cooney, you are mistaken. You would not get any more money unless you were producing more. I am afraid that you mistake work for production, and look upon your production merely as the effort you put forth."

This proved to be the case, because the facts were that he produced a great many more molds in a given time than formerly, because the job was properly prepared for him, laborers doing this, that, and the other thing; and the remarkable thing is that Mr. Cooney told me he had, in former years, himself tried to prevail upon the foreman to have some of that work done by somebody else, because he could put his own time to better advantage. I said, "That is just an example of what we do. We do not even wait for you to ask us those things. We systematically ferret them out. We make you more productive, because we make you utilize your ability as an expert molder to do real expert work, and eliminate the waste of your time on the easier jobs that can be done by less competent men."

The Chairman: Mr. Cooney, in testifying before this committee, stated one instance in which he had made a mold—I do not recall the technical terms—made one mold in the same frame or case that could have held two molds, and in so doing was following out the directions from the planning department after this new system had come into existence; and he clearly demonstrated to my satisfaction that he could have placed two molds in the same frame or case and thereby have saved a great deal of work, or produced more with the same amount of work.

Mr. Barth: Yes?

The Chairman: That would not be an indication of the correctness of the statement which you now make, would it?

Mr. Barth: That must have been a different mold from the particular one I was speaking about; and the case only demonstrates the general fallibility of human flesh. We frequently make mistakes; and we want a man, as soon as he discovers a mistake, to call our attention to it, and preferably before he does anything else. All we insist upon is that a man shall not deviate from our instructions, but immediately report to us when the instructions look wrong to him in any way. We want implicit obedience to our orders and instructions, unless a man can show us that there is something wrong about them. Just as when you have a servant in your house and you give her an order that she thinks is not right—if she goes and does something totally different from what you wanted done, without referring back to you, you do not like it. We do not want any man to do a thing just because he is told to do it. Absolutely not. But we do want him to do what he is told, unless he can first prove to us that he can do it better some other way, and then gets that way sanctioned by us.

Mr. Tilson: Are there any cases where men do produce no more than formerly, and get more wages?

Mr. Barth: Yes; and that is merely because the circumstances happen to be such.

Mr. Tilson: In other words, he had not been receiving what he should have been?

Mr. Barth: That is it.

The Chairman: There were some instances brought to our attention in which the workman stated before the committee that he was, under the new sysem, receiving greater wages without any greater production, and he specified what he had produced, and what he had received for his production, and what he was then producing, and what wage he was then receiving, showing that for the same amount of production he was getting a greater amount of wage under the new system than under the old system; would that occur?

Mr. Barth: That can be due to one or the other of two causes. Either a mistake had been made in making the time too long; or else the man had done so well before that, the way we look at it, he had not gotten what he was entitled to before. Let me add that these cases are so rare that the net result is always a substantial increase of production.

Mr. Tilson: As I remember this young man, his principal objection was that this good thing was too good to last. He was getting something like 30 or 40 or 50 per cent increase, as I remember, over his former wages, and was not producing any more, and he said he knew that could not last, and therefore he did not have any confidence in it.

Mr. Barth: A case of that kind appearing early in the introduction of these methods must be looked upon as exceedingly unfortunate, for the very reason that men are necessarily, and possibly correctly, suspicious of all new things.

Mr. Tilson: I thought this young man was a particularly fine workman; he gave every indication of being a particularly good man in his line.

Mr. Barth: I can only say that I am delighted that the man got the money, and I am sorry that the circumstances were such that he got the wrong idea of our intentions.

Mr. Tilson: I was rather glad he got it too; I thought it was due him.

Mr. Barth: Now, as regards the manager's side of this question, and the general impression that no manager would be likely to want this system unless he could make more profit: In no less than two cases in which managers have gone into our methods, they have expressed the sentiment that they would be perfectly satisfied if they found that they themselves were no better off, and the men merely were benefited.

In other words, there are as many managers who are broad-minded human beings as there are among other classes of men. But you do not pick up that kind every day, and for that reason I feel that it is not safe for a man to be working merely with the end in view of benefiting the workmen without also being able to benefit the owners of a company.

Mr. Tilson: In order to protect the workman himself, it ought to be a part of this system that the employer should benefit by it, in order to be sure—

Mr. Barth: Most managers would not have gone into it if they did not get a part of it. It is not safe to count without that. You always have to get down to the selfish motives when you deal with any class of humanity, at the present day.

The Chairman: Is it not true that the same selfish motive would cause the workman to be very wary of anything that looked like a bait; that motive would cause him to be wary?

Mr. Barth: Surely; and nobody can find any fault with him, in view of the experiences of workmen with the ordinary style of manager.

Mr. Tilson: We are all getting pretty close together there now.

Mr. Barth: I can not believe that as ordinary intelligent human beings we can be very far apart. If I can not convince you, you can convince me. Right here, will you allow me to make part of this record at ~~least~~ a part of an address that I made two years ago to a party of managers. Reading it you will realize that I do not handle things with kid gloves. I would like to make the whole thing part of these records. I was asked to address them on premium systems. (Reading:)

PREMIUM SYSTEMS, BY CARL G. BARTH, FROM SYNOPSIS OF PROCEEDINGS OF THE TWELFTH ANNUAL CONVENTION OF THE NATIONAL METAL TRADES ASSOCIATION, APRIL 13 AND 14, 1910. HOTEL ASTOR, NEW YORK. ALSO CLIPPINGS FROM INDUSTRIAL ENGINEERING AND AMERICAN MACHINIST.

(Industrial Engineering and The Engineering Digest. 90 West Street, New York. September, 1910.)

COOPERATION BETWEEN EMPLOYER AND WORKMAN

Twenty years ago the late Abram S. Hewitt, in a famous address delivered before the American Institute of Mining Engineers, spoke of a coming industrial age when the laborer should be a capitalist, and when labor would employ capital instead of capital employing labor. We are as yet far from reaching that ideal, if we ever shall reach it, but there are indications that a new era is approaching in which some of the good features of Mr. Hewitt's ideal will be realized, the era of cooperation between the employer and the workmen to increase the efficiency of both capital and labor and to secure larger returns for both.

One of the prophets of this new era is Mr. Carl G. Barth. He is one of the small group of men who have been active in introducing the task and bonus system with scientific time study into workshops, and he speaks from experience. He is not a believer in the various premium systems, which he looks on as "patent medicines." In a paper read at the New York meeting of the National Metal Trades Association in April Mr. Barth gave some ideas on the cooperative system, and on the evils which it is expected to overcome, which are worthy of careful consideration by every employer of labor. We quote from his paper the following:

PREMIUM SYSTEMS

(A general discussion by Carl G. Barth)

GENTLEMEN: It would seem that the various premium systems in vogue at the present time have been so thoroughly discussed, both in our technical papers and in addresses before this and other industrial organizations, that by this time everybody interested would know and understand the subject quite thoroughly. It would, therefore, also seem quite out of place for anybody to attempt further to enlighten the public in the matter, and particularly the members of this organization, than whom no body of men can have been more vitally interested. However, the fact that your commissioner has invited me to address you on the subject shows that everybody does not feel that way about it, and as a consequence, I shall not hesitate to attempt to discuss with you the results of my own studies and experiences with the subject as well as I can in the limited time allotted to it.

PREMIUM PLANS AS PATENT MEDICINES

Let me say at once that I personally look upon most of the premium schemes as so many patent medicines only, compounded from time to time by old-school physicians as remedies for difficulties over wages between employers and employees; for just as most of the ills to which human flesh is liable can not be cured by medicine alone, although often much relieved by it, so also no particular mode of paying a workman can possibly be looked for alone to remove the distrust and misunderstanding between employers and their employees which, through strikes and lockouts in the past have led up to the present-day labor unions on the one hand and to such unions of employers as your own organization on the other.

"What you need is to take your employees individually into your full confidence—I mean, of course, through a sufficient number of the proper kind of well-trained foremen and other representatives as middlemen—and so to cooperate with them that each will learn to look upon you as his direct partner in the way of delivering the goods. Then if, as often as you together accomplish a substantial task you give him in addition to his regular wages, and, as it may be figured almost equally satisfactory by any of the various schemes already in vogue for paying workmen, a fair share of the extra profits you will derive from the extra results obtained by your hearty cooperation, all will be well between you."

EMPLOYER MIGHT SAVE MAN'S TIME

Now, what do I mean by such cooperation? Only that you carry to its ultimate conclusions what, in the very nature of your being the employer, you already do to a lesser extent, for it is evident that without any cooperation on your part your employees can accomplish nothing. To realize what this means put yourself in the position of one of your employees and examine into everything that must be attended to before he can actually devote his undivided time and attention to the particular part of his job for which he is especially fitted and for which you have especially hired him. You will find that in most cases he is compelled to do a number of things which in reality are foreign to his job and which you can do for him much better and cheaper than he can.

You will perhaps find him wasting a lot of time getting the material he is to work upon to his machine, or in getting hold of the right drawings, or in procuring the tools that in his opinion are the most suitable for the job, but which in reality may be far from such, both those for securing the work and those for doing the machining, or whatever else is to be done; and you will find that if he calls on his foreman for assistance this overworked functionary is just then too busy with the clerical part of his duties to give him sufficient attention, if, indeed, any at all. You will also find that there is something or other the matter with his machine—not enough to make it impossible to do the work on it, but just enough to make him lose a good deal of time making the best of it.

REAL MANAGER LOOKS AFTER THESE DETAILS

More than this, you may find that the work he has to do is not that for which his machine is best suited; or that, if it is so in design, it is not so speeded as to allow the work to be done in even approximately the time in which it ought to be done; or if it is, that the man, even though a first-class mechanic, very naturally does not know enough about the art of cutting metals to select the most economical feed and speed for his work. In fact, there is no end to the things that you may thus find which, if you think about them rightly, you will conclude that it is really your part of the business as a true manager to have looked after in a careful and systematic manner in order to get the most out of your machines and their attendants and make these feel that you have their general comfort and ease of mind at heart.

PIECEWORK TIME UNCERTAIN
REDUCTIONS FORCED UPON EFFICIENT

You will also realize what a haphazard and uncertain thing the time for doing a piece of work is under existing conditions and that no end of records of what this time has been can be a real indication of what it should be, and hence that no system or plan for paying a man for his job which has such records for its basis can constitute a satisfactory contract between yourself and your employees, although the worst part of such contracts, whether in the form of piece rates or premium time allowances of one kind or another, is the fact that you almost invariably stand ready to force your employee to accept readjustments of them when he, either through exceptional good luck or by extraordinary efforts, has succeeded in doing a little too well.

Nor is the matter materially improved by any such ingenious, automatic, premium-regulating plan as that first invented by Mr. Rowan, of England, to guard against the possibility of a workman ever carrying too much of his employer's money away in his pay envelope, and thus also to avoid the irresistible temptation to reduce a time allowance or a piece price which in this manner has proven itself such a treacherous thing to the management.

VARIOUS PLANS ARE COMPARED

At this point of our argument it may perhaps be of some interest to make a comparison of the original Halsey premium plan and the modification made of this by Mr. Rowan as just referred to. We do this by means of figure 1[1], in which the Halsey plan is represented both with a premium equal to one-third of the time saving effected, as favored by Mr. Halsey himself, and with a premium of one-half of this time, as favored by other champions of this plan. The diagram is made out for a job with a time allowance of 15 hours and shows all the theoretically possible earnings on all three premium plans referred to, the day wage portion of these and the percentages that the premium bears to the latter. It will be seen that the premium for reducing the time allowance to 10 hours, or by one-third, amounts to 3⅓ hours by the Rowan plan, 2½ hours by the Halsey plan with premium of one-half the time saved, and to 1⅔ hours by the Halsey plan with the premium of one-third. Also, that in percentages of the time actually worked, these various premiums amount respectively to 33⅓ per cent, 25 per cent and 16⅔ per cent. It will further be seen that, for the Halsey plan with premium of one-half the time saved, this premium is exactly the same as for the Rowan plan when the time is reduced to 7½ hours, or in other words, cut in half; also that this premium, which amounts to 3¾ hours, or 50 per cent of the time actually worked, is the maximum absolute premium that can be earned on the Rowan plan. Similarly the Halsey plan, with the premium of one-third the time saved, gives the same premium as the Rowan plan when the time allowed is reduced to 5 hours, i.e., by two-thirds; and it will be seen that it amounts to 3⅓ hours, or 66⅔ per cent of the time actually worked.

WORKMAN MAY SCENT REAL PURPOSE

A further study of this diagram will make it apparent that the Rowan plan can not be very successful in inducing a workman to give away the time in which he can do a piece of work when the time allowance for this is excessive; for it is then so easy for him to earn a substantial increase over his day wages by only moderate exertions that the slightly higher relative increase that further exertions would net him will not appear to be worth his while. Of course, I do not mean to say that a workman will read this into the mathematical rule for figuring the premium on the Rowan plan the first time he is put to work on it, but experience will soon teach him to do so and to view it in its true light, i.e., an ingenious plan to induce him, without adequate remuneration, to disclose the real time required for the execution of a piece of work about which the management has shown its complete ignorance.

Compared with this scheme, either of the original Halsey plans provides a more moderate premium where only moderate exertions are required to reduce materially the time allowance; but one which increases at a sufficiently high rate with increasing time reduction to constitute a real incentive for a man to take advantage of it, provided he has no reason to fear that the handsome premium thereby earned will weigh so heavily in the manager's stomach as to induce him to take what he believes to be the right remedy for this kind of indigestion, viz., reduction of the time allowance for the job—only later to discover that what temporarily was medicine to him was poison to the workman.

---

[1] Not printed.

Application of Principles

GUESS METHOD DETERMINING TIME ALLOWANCE

Having thus made a brief review of the application of the two principal premium plans to a job for which the management has guessed, by aid of previous records or otherwise, that 15 hours would constitute a proper time allowance—such a guess method of determining a time allowance being the only one the originators of these premium plans ever had in mind—let us now also see how these may be applied, the same as Mr. Taylor's differential piece-rate system and Mr. Gantt's bonus system, to work done under a management which thoroughly cooperates with its employees, and which because of this cooperation, is able to set a task time limit on a piece of work such that if this cooperation results in the work being done within this time limit the workman receives his share of the good results obtained in the form of a substantial bonus or premium. Such an application of these premium plans, together with their comparison with the two cooperative task plans, is exhibited in another diagram.

MATHEMATICAL EXPLANATION OF DIAGRAMS

Figure 2[1] is made for a job for which 10 hours of work is known to the management to constitute a task for which a premium or bonus of one-third, or 33⅓ per cent, over and above regular day wages is a sufficient prospective reward for the workman to induce him to work hard and earnestly to accomplish his part of this task, with the possibility of his even doing somewhat better. Taking this time of 10 hours and this premium of 33⅓ per cent as our basis for figuring, we find the total time allowance necessary for the Halsey plan with a premium of one-third the time saved to be 20 hours; for the same plan with a premium of one-half the time saved to be 16⅔ hours; and for the Rowan plan, with a premium equal to the time actually worked multiplied by the time saved and divided by the time allowed to be

$$15 \text{ hours; for } \frac{20 \text{ hours} - 10 \text{ hours}}{3} = \frac{16\tfrac{2}{3} \text{ hours} - 10 \text{ hours}}{2} = 10 \text{ hours } \times \frac{15 - 10}{15} = 3\tfrac{1}{3} \text{ hours, or the premium}$$

to be established for 10 hours work on all three plans, all as clearly brought out in the diagram.

The Taylor differential piece-rate system is represented in figure 2 by a broken line, for which the time limit for the high rate of pay for the job under consideration is the same 10 hours for which we have made the premium 3⅓ hours, or a total high rate equal to the man's wages for 13⅓ hours.

The low rate of pay is here taken as five-sixths of the high rate, and it will be seen that the workman may be about 11 per cent behind the time limit for the high rate before the low rate will amount to only his day wages; but also that, by further falling behind, he runs the risk of earning a substantial negative premium. Thus, for instance, if he should spend 15 hours on the job, or as much as the full time allowance on the Rowan premium plan, his earnings would be more than 25 per cent below his day wages.

TASK WORK VERSUS PREMIUM PLANS

It will be seen that, while Mr. Taylor's plan offers a greater inducement than any of the three premium plans to reduce even the task time of 10 hours, Mr. Gantt's plan does not offer as much, as it is rather interesting to note that Mr. Halsey's premium plan when the premium is made one-half the time saved, in this particular respect exactly splits the difference between the Taylor and Gantt task plans, while the Gantt bonus and the Rowan premium offer substantially the same inducement for any practically conceivable reduction of the task time. It will be seen that the greatest difference between the Taylor and the Gantt plans is that the latter guarantees the man his day wages, while the former penalizes him even severely when he runs too far behind. On the other hand, it will be seen that all of the three premium plans considered enable a workman to earn more than his day wages for small efforts, even if the time allowance is such as to demand the performance of a substantial task before a premium of as much as 33⅓ per cent can be earned, while the amount of this defect varies considerably among them, with the Rowan plan as least objectionable in this respect. However, it will also be seen that, in the neighborhood of the time for 33⅓ per cent premium, the three premium plans give results that differ but immaterially in this respect.

To overcome the defect of the premium plans when applied in connection with task work, as tacitly suggested by presenting them as in the diagram under consideration, all we have to do is to demand a certain amount of time saving before the premium figured will be allowed. Thus, if we wish to go the whole length and pay no premium unless the work is performed inside the 10 hours, we only add to the various rule that the premium figured by the mathematical part of the same will not be allowed unless the time saving amounts respectively to one-half on the Halsey plan with premium of one-third the saving, two-fifths on the same plan with premium of one-half the saving, and one-third on the Rowan plan.

Comparison of Plans

ADVANTAGES OF HALSEY PLAN

The Halsey premium plan with premium one-half the time saved applied in this manner would seem to have the following advantages when compared with the other plans considered:

1. The premium earned when the time saving for any reason is enough to reduce the time below that set as the task, while greater than the fixed Gantt bonus, is not so great as the Taylor high rate, and thus meets the idea of the manager so frequently met with who insists that the greater the premium earned by the man the less should even be the flat labor cost to the employer.

2. It is mathematically the simplest of the three premium

---

[1] Not printed.

plans considered and while not so simple as the Gantt bonus plan, it is sufficiently so not to be mathematically objectionable in the slightest degree.

3. Like the rest of the premium plans and in common with the Gantt bonus plan, it guarantees a workman his day rate, a perhaps negative virtue, but still one insisted on by most managers and workmen.

4. It offers apparently the easiest way of gradually training a day worker up to the performance of a substantial task; for, while the eventual task demanded would be a saving of two-fifths of the full time from which the premium is calculated, this may be demanded by gradual steps only, as, for instance, one-tenth, one-fifth, three-tenths, and finally two-fifths; i.e., demanding that one-tenth more of the full time be saved every time the job is repeated, until the final task time has been reached.

MUST QUIT GUESSING AS TO TIME

I do not mean to pretend to have exhausted the subject by what I have said, but at the same time I want to be on record as not considering the particular manner in which a workman's reward for accomplishing his task is figured to be of anything but secondary importance. The important matter is that we abandon the old way of guessing at the time it takes to do a piece of work and earnestly set to work to obtain scientific methods for the determination of the best time in which work can be done, and on the strength of this set ourselves and our employes a definite task to accomplish each day, as so strenuously recommended by Mr. Taylor.

Before relinquishing the platform to the next speaker I like to call attention to one of the greatest difficulties that all of the various schemes considered have had to contend with. I have in mind what I call, for lack of a better term, the unevenness of the machine equipment in most shops. To take a simple example, I found one shop with eight drill presses, of which only two had the same feeds and speeds, and still rates made for any of them were unhesitatingly applied to the rest. So, also, a number of gear cutting machines, lathes, etc. The equipment was gradually unified by changes in both feeds and speeds of the majority of the machines in any one class, so as to make them all practically the same as the few already near enough alike.

UNIFORMITY OF SHOP EQUIPMENT

Diagram E[1] is an illustration of one of the drill presses thus changed, the changes consisting in one new set of back gears, new cones, and a double set of speeds to the counter-cone, and finally a completely new feed box secured from the manufacturer of one drill press already so equipped. And diagram F[1] shows the feeds and speeds of all eight drill presses, and it will be seen that these are practically all alike, except that the two largest of them have one speed slower than the rest, and also a uniformly coarser set of feeds, though this is such as to agree quite closely with the smaller drill presses within a certain field.

FIRST STEP TOWARD PEACE OF MIND

I have thought it well to call your attention to this one phase of the standardization of shop equipment, about which so much else has been said and written in connection with both premium and piecework plans, because an experience I had a few years ago taught me how little even tool manufacturers realize its importance. In a shop where we decided to buy two new drill presses, these were ordered and promised to be exact duplicates of two already on hand, and the greatest stress was laid on the fact that we so wanted them. I do not know if you can conceive my disgust when the new presses arrived and were found to be totally different in driving gear and feed motion; and the fact that they proved to be of much superior design, when considered by themselves, did not make me feel a bit better, for the unity of the equipment I had aimed at was destroyed, and this was of more importance than the improvements made by the manufacturer. I look upon such unification of the machines in a shop as the first step toward deriving peace of mind from any mode of paying workmen, and in the ultimate analysis of all our motives, that is what we are all after.

Mr. Gantt asked the privilege of the floor and this being granted he said:

"PIECEWORK BY ANOTHER NAME

"I am very sorry to have to correct one or two statements made by Mr. Barth with reference to the system that I am supposed to stand for; but Mr. Barth has described the tasks and the bonus method system as introduced at the Bethlehem Steel Works about 10 years ago. As introduced there it had certain defects, and did not produce the result that we desired, namely, that of giving a man a continuous inducement to do all the work he could. About a year afterwards we discovered a method of giving the man his additional compensation. We gave him an additional compensation depending upon the amount of time that was allowed for the work; in other words, we practically fixed a piece rate. The time allowed was 10 hours, and that gave him an additional compensation of 3 hours, so that his pay was 13 hours for the work; that was simply a piece rate. If he did not do the work in 10 hours he got his day's pay. We have adhered to the idea of a task bonus instead of sticking to piecework, because there is much objection to the term 'piecework.' Some people are fighting what is broadly termed piecework, but if you can give them the thing in another shape, if you can call it by something else, they do not object to it. The only difference is that we do not allow a 'no account' man to work on piecework. He must first come up to a certain degree of efficiency set by the expert before he is allowed to work piecework; otherwise he gets day pay. If he is not any good at day-pay work, of course, we would get somebody in his place."

Mr. Barth was granted an opportunity to reply to the statement by Mr. Gantt.

FROM PIECEWORK TO THE PREMIUM PLAN

(By F. A. Halsey)

The premium plan as originally published was essentially an addition to the day's-work plan, the workmen being supposed to be continued at an existing rate of daily wages with an additional premium based on an increase of output, and in most, if not quite, all discussions of the plan it has been stated in words, or tacitly assumed, that the method of payment prior to the use of the premium plan was by simple day's work. This has been true of everything that I have written upon the subject. During my shop life I had no experience with piecework and no occasion to devise a method of changing from piece to premium work, and although many inquiries have come to this office asking for details of the methods to be followed in cases of this kind I have always felt that, in view of the above-described situation, I was not competent to offer advice of value.

---

[1] Not printed.

CARL G. BARTH'S PLAN

Carl G. Barth, who is so widely and favorably known by his work in association with Fred W. Taylor, has had this problem before him and has worked out a solution which in several applications has proved entirely successful. The idea is simply to start with a wages-per-piece limit instead of a time limit. The workman is put on an hourly wage rate in place of the previous piece rates and he is then offered a premium of part of the difference between the wages-per-piece limit and his wages for the time consumed in doing the work.

Thus, suppose the wages-per-piece limit for a given piece of work to be $2.50, the workman doing it having an hourly rate of 25 cents, and suppose he does the work in six hours. Under these conditions the workman's earnings and the new cost would appear as follows:

Wages-per-piece limit	$2.50
Hourly wages for six hours	1.50
Total saving of wages per piece	1.00

piece is $\frac{\$1.00}{3}$ = .33⅓

If the premium is one-third the total saving the premium earned per

Wages for six hours	1.50
Premium per piece	.33⅓
Total cost of work	1.83⅓

Original cost of work	2.50
New cost of work	1.83⅓
Saving to employer	.66⅔

Workman's wages for six hours	1.50
Premium	.33⅓
Workman's total earnings for six hours	1.83⅓

Workman's earnings per day of 10 hours

$$(183\tfrac{1}{3} \times \frac{10}{6}) = \$3.05$$

Workman's new earnings per day	3.05
Workman's old earnings per day	2.50
Workman's premium per day	.55

ADAPTABILITY TO VARYING CAPACITY OF MEN

(American Machinist, Mar. 25, 1909).

A feature of the plan of which Mr. Barth makes a great point is that it automatically takes care of different rates of hourly pay based on the capacity of different men to produce varying amounts of work by, in effect, giving a low-rate man an extension of time before the limit is reached. Thus under the rate assumed above, the workman having a rate of 25 cents per hour has, in effect, a 10-hour limit which must be cut down before he earns a premium; but on the other hand, a workman having, say, a 20-cent rate per hour, has, in effect, a 12½ hour limit—which he must cut down before earning a premium. Or, to put it otherwise, a workman earning 20 cents an hour would, by doing the work in 7½ hours, earn the same premium that the 25-cent workman earns by doing it in 6 hours. This is a distinct advantage over the time-limit plan which handicaps the low-rate workman by giving him the same time limit as that given to the workman getting a higher daily rate.

In Mr. Barth's practice the task idea is introduced by requiring the workman to do a certain per cent better than the base rate before any premium is paid, the premium when paid being, however, based upon the entire saving of time. This feature is not, of course, essential, and may be employed or not as the user of the plan prefers.

THE PROPER PREMIUM RATE

As against a premium of one-third the total saving on which the above tabulation is based, Mr. Barth, like so many others that have adopted the premium plan, pays a premium of one-half the saving. He does this, however, after a preliminary time study which frequently results in the reduction of the wages per piece limits below the previous piece rates. Under these circumstances, a premium of one-half the saving is, I believe, justifiable, but when the limit is simply taken from existing cost records, I believe it to be too high, and that a premium of one-third the saving is all that the manufacturer should pay, and this whether the limits are based on records of the day's work plan or on those of the piecework plan.

There is an appearance of fairness about a half-and-half division which makes it very attractive on the surface. Experience shows, however, that it is an unnecessarily high rate, the incentive under one-third the saving being sufficient in nearly all cases to bring about an increased output and to lead to very substantial increases in the wages earned.

This conclusion is not a new one, as I have advocated a premium rate of one-third the saving from the beginning, and it is no more than proper to add that accumulated observation only serves to confirm the wisdom of the conclusion. I know of one conspicuous case, which ultimately became a local bellwether and was largely followed, in which, against my own advice, a premium rate of one-

half the saving was established and in which the manager who did it now regrets the decision.

The Chairman: You mentioned, either in this statement here or in connection with it, that when you employed a skilled molder you wanted a laborer to shovel his sand.

Mr. Barth: Yes.

The Chairman: Have you ever given any attention to the idea that a change of work is rest?

Mr. Barth: Oh, yes; a good deal.

The Chairman: Is it not true that the more you specialize the work and concentrate the attention of the workman on any given line of work, that there is less opportunity for the use of all the muscles?

Mr. Barth: Mr. Chairman, I am perfectly frank to say that we are only on the threshold of knowing how to make the best of all these things. There is not a leader among us to-day that dares to say that we know all about it. We make no great pretenses. We are only earnest men trying to work in the right direction. We recognize this element, but have not been able to make much use of it, and in so far we have failed in being thoroughly scientific.

Mr. Chairman: Mr. Barth, last night, I believe, you made a very severe criticism of our school system.

Mr. Barth: Yes, sir.

The Chairman: Now, our school system has been developed under the leadership of men who have been specialists in that particular line and who believed that they had scientific methods of teaching. Do you not think that there is just as much room for criticizing any other line that assumes to be scientific, unless it fully demonstrates that it is scientific?

Mr. Barth: Absolutely. We admit that, and we do not pretend to be perfect in this. We are doing our best and all things have to have a beginning. But the beginning has already resulted in a great deal of good.

The Chairman: In other words, you are but experimenting?

Mr. Barth: Not altogether experimenting; but we are big enough to realize that there is a great deal more to be done, a great many more experiments to be made, that a great many more minds must be brought to bear on the thing, a great deal more knowledge obtained. The point in which we are especially weak, I believe, is psychology, which, however, is a comparatively new science, of which but little practical use has as yet been made in the world. How have we been dealing with criminals until recently? Absolutely in the wrong way, as investigation shows; we are only beginning to get light on that subject.

As regards education, I can tell you that this country is still looking for the solution of problems that were solved in my native country 40 years ago. I happened to get the benefit of the solution of the problem of teaching mathematics, and that is the reason why I am looked upon as somewhat of a mathematician, and I did not spend a fraction of the time in learning mathematics in school that the school children of this country spend to-day.

The Chairman: Mr. Barth, can you give any instances of men having been bettered by your system?

Mr. Barth: As an individual who has as much right as anybody else to be happy in this world, so I also have a right to take my own case as an answer to that question. I have in this work found a real ideal to work for, and in spite of an awful lot of trouble I have had in connection with the same, I am to-day a far happier man than I used to be. I have also made other people happier by getting them to cooperate with me for the same purpose, and I will particularly mention the case of one man, who had a great struggle, when young, to acquire an education. He managed to scrape up enough money to go through a university and did so well that later on he became a professor in another university, a position in which he expected to find an ideal to live and work for. Herein he was disappointed, however, so that after three years he gave it up and went back to the shops in which I found him.

I have a letter at home that I cherish highly, in which this man states that he owes it to me that, for the first time in his life, he has found something worth while working for. There are plenty of others, though I have nothing to show for it, black and white, except this one case. Neither can you ignore Mr. Taylor himself, who certainly is happier now when he is working and devoting his whole life to this same ideal, and has done so for the last ten years without receiving a cent of compensation; not a phantom ideal, but a practical one, one that can and will be more nearly approached in this world as the years roll by.

Besides, there are any number of young men who have been materially promoted through our system; and it is my firm conviction that there is not a man who has it in him to become a better man, that is not made more manly because of working under the conditions that we strive to create.

As a further answer to the question as to the necessity for increasing the productivity of the men, so long as we yet have not solved the problem of properly distributing what we already produce, one thing that surely could be done long before the final solution of this problem has been found, is by the increased productivity of men, to get women and children out of the factories, to stop all night work which is not absolutely necessary, and to make it possible for many a girl to stay at home and be a part of a happy home who now is compelled to sell herself in the streets of our large cities in order to hold soul and body together.

The Chairman: Mr. Barth, do you look upon a time study in the manner in which it is taken in scientific management, with a certain amount of time arbitrarily added to the time study, as being a scientifically accurate determination of the time that it ought to take to produce an article?

Mr. Barth: Mr. Chairman, I am very glad you asked me that question, because I gladly and frankly admit that some of those percentages are not as scientifically ascertained as we would like to have them, and as we hope to get them some day in the future. We have time-study men who have done enough work, however, to have very good judgment about such percentages, and no harm is done when that percentage is not sufficient, because it is immediately corrected and it helps to better preparation in the future. But the only scientific way, which has been practiced in all occasions where the product comes in sufficiently large quantities, is, besides taking the individual operations and the sum total of these, to take the total time, as a man does a job, as fully explained by Mr. Taylor the other day.

Mr. Chairman, if I were not confronted with the necessity of still, for some years, to make money, I should establish a laboratory where I could study all those conditions at my own expense; and there is, in fact, a group of men now that have seriously under consideration the matter of finding ways and means to give me money to carry on experiments and investigations of just this kind, which, however, really should be undertaken by the United States Government. We gladly admit that we are not as thorough as we would like to be—who is in this world? But I have the inclination and patience to do that kind of work, as shown by the fact that I spent 15 years on one mathematical problem, and 3 on another, while I have a great many unsolved ones now. However, I still have to work to make money, particularly as I, unlike most people, do not care to have my savings make more money for me through investments; and this, because I believe the time will come when nobody will get the things money now brings except by the personal services he renders to the community; though that time may still be 5,000 years coming.

Commander Long: In your opinion, how would a system of management work wherein there is no premium or bonus contemplated, but where the work is systematically routed, properly, scientifically, and fairly timed, the only recourse being discharge when a man persistently fails to come up to the perfected standards. I use these words advisedly, "systematically routed, and properly, scientifically, and fairly timed, the only recourse being, when a man persistently fails to come up to the perfected standards, to discharge him?"

Mr. Barth: A system of that kind is perfectly workable, in my opinion, but I should not want to lend myself to the adoption of such a system because a system of that kind would be far more liable to result in increased production without the working man getting his share of it.

Commander Long: I was not expressing any opinion; I was just asking a question.

Mr. Barth: I understand that. I am afraid, Mr. Chairman, that with such a system your fears would be more justifiable. That is all.

Thereupon, at 5.10 o'clock p.m., the committee adjourned to meet at 2 o'clock p.m., Friday, February 2, 1912.

Wilfred Lewis

October 16, 1854 **December 29, 1929**

As we go to press word has just been received of Mr. Lewis's death at sea on his return from the World Engineering Congress in Japan, where he had been serving as a Taylor Society delegate. Details of his life and work will be printed in the next BULLETIN.

Reviews of the New Book "Scientific Management in American Industry"

An Engineer's Appraisal

By DEXTER S. KIMBALL
Dean of the College of Engineering, Cornell University

THIS interesting and instructive volume is a symposium by prominent members of the Taylor Society and is issued under the auspices of that society. It is by far the best piece of work that the society has fathered. The twenty-six contributors to the volume are all well known in the field of management and its literature. The book is divided into six sections as follows: Introduction; Management Research; Management Standards; Control (of operation); Control (through standards); Human Aspects. It will be seen, therefore, that the book is not simply a collection of articles, but has been carefully planned and coordinated. This editorial work was done by Mr. H. S. Person, Director of the Taylor Society, and it has been well done. The volume presents an appearance of continuity that is helpful in grasping the trend of thought back of its conception. The book presents scientific management in its many aspects as it appears to these authorities today. It is not simply a reiteration of Mr. Taylor's philosophies or actual accomplishments, except as is necessary to lay a background and a foundation. There are no lengthy descriptions of Taylorized plants, but it is rather a series of excellent papers, grouped under the leading headings given in the foregoing, that show what is being done in the field today.

As everyone knows there has been constant growth and change in the field of management ever since Taylor's classic experiments. His ideas have been adopted under many combinations of elements, no two alike, yet all tending in the same direction. This volume treats of many of these elements in their latest forms without endeavoring to set up ideal combinations. Therefore, it is of value to all administrators and students of this new science without reference to size or character of plant.

As President Kendall in his foreword has noted, the book marks the first decade of organized work of the Taylor Society. The society has existed for twenty-five years, but during the earlier period it was of a rather informal character. Ten years ago, however, the society established a permanent office and a staff of workers and, as President Kendall states, "This book is a summary of a decade's study, analysis and exposition of the philosophy, principles and procedures of scientific management; and a picture of its status and influence today." The Taylor Society is to be congratulated upon this very fine production which should be in the possession of all who are interested in this most important field.

Economists and the "Mental Revolution"

By HORACE TAYLOR
Assistant Professor of Economics, Columbia University

THE MODERN system of industry, Topsylike, just grew. Lacking plan or pattern, deriving its specific forms from the sheerest accidents, having its motivation in nothing more consistent than business expediency, the new industry became a "system" only when it grew to self-consciousness with maturity. Business men, Olympian in their magnificent individualism, established "independent" enterprises such as factories, railroads and electrified communication without reference to their functional implications to any system at large, but simply and solely because these modern contrivances promised pecuniary rewards, which, according to the tenets of business itself, is reason enough. The very lack of systematic implications, however, means that the launching of industrial enterprises and of the policies necessary for their continued operation were based on mere matters of opinion or, as we sometimes say, of speculation.

Systems exist only in our minds. They are ways in which the mind comprehends an array of more or less discrete particulars and identifies significant relationships among them. Obviously, the kind of system created by a given mind depends on the direction or point of view from which the mind is projected and also the technical criteria with which the mind is equipped. Thus a "system of industry" may be conceived by an economist as a congeries of pecuniary relationships. Or, to an engineer, it may consist of a complex of mechanical processes. The business man, on the other hand, is busy with the practical and important problems of making profits for himself or for his stockholders. He is little concerned with systems, nor is he sufficiently detached for system-building until he is forced, by the immediate problems with which he is faced, to seek the threads of relationship which tie discrete facts into broad questions of policy. That business men are seeking and finding these threads is evidenced by several contemporary tendencies. Thus, for example, the old notions of "independent" enterprise are giving way to a consciousness of group interests which is best illustrated, perhaps, by the absorption of functions by trade associations. The integration of industrial processes and the wider employment of contracts go still farther in recognizing the lack of independence among private business concerns. And, most striking of all, the wide interest in methods of internal control—the precise standards of scientific management—demonstrates a genuine desire for systematic understanding on the part of the business community. These movements in the direction of systematization of industry appear to mark a partial realization of the "mental revolution" so urgently sought by Frederick W. Taylor.

Engineers, next to business men, have had the largest part in shaping modern industry. The industrial revolution received its impetus from new methods of generating and applying power. Back of those developments—and essential to them—lay the triumphs of marine engineering and navigation of what historians call the commercial revolution. In fact, to trace genetically the contributions of engineers to industry would take us beyond Hero and Archimedes to the truly revolutionary inventors of the wheel and the lever. And yet, in spite of their constant concern with the affairs of industry, engineers have not, until recently, been admitted to its inner councils. Business men traditionally have employed engineers to perform prescribed tasks but have reserved to themselves the determination of what to do and how to do it. When, in their consciousness of need for systematizing their affairs, they commission engineers to establish standards and to co-ordinate and synchronize the operations of their businesses, the deviation from convention is so marked that we regard it as another escapade of those revolutionary engineers. We call it a "mental revolution."

Since Taylor's early experiments at Midvale the engineers have been creating a science of management along lines laid down by him. And yet, perhaps because the participants in this movement are more interested in working on their problems than in explaining their ideas to the world at large, laymen have had very little understanding of what the new science is or of what it is about. The publicity that the movement has received has been in part sensational and in part vitiated by charlatanism and misunderstanding. Many engineers have written monographs and articles concerning the detailed problems with which they were working—in fact the New York Public Library published an impressive bibliography of these works several years ago. Yet the workers in the field, apparently by tacit agreement, did not attempt a systematic account of basic principles, leaving the works of Taylor himself as a foundation of doctrine. And Mr. Taylor, genius that he was, was not gifted at exposition. Perhaps this is best evidenced by the fact that his clearest declaration of principles was presented in his testimony before a congressional committee when he merely answered the questions that were asked. At any rate laymen went right on believing that scientific management was time and motion study, or a bonus wage plan, or functional foremanship, or cost analysis, without realizing that these are only devices of a system which seeks to standardize all industrial processes and operations and to create comprehensive controls on the basis of these standards. A few recent works, among which the volume edited by Edward Eyre Hunt, *Scientific Management Since Taylor,* is outstanding, have attempted to evaluate scientific management in fairly general terms. Yet, even in these works, there is lacking any clear exposition of principles.

For all of these reasons, as well as for merits of its own, the new volume of the Taylor Society, *Scientific Management in American Industry,* is a major accretion to the literature of this subject. For the first time there is presented to readers who are not engineers a working idea of scientific management in its total aspects. To criticize here the detailed matters of research, standards, controls and organization with which the book is concerned would be both presumptuous and of little worth. That, again, demands the attention of an engineer. Yet some of the implications of scientific management, and of this volume in particular, to the field of economics may properly be considered.

Classical economics is based on hypothetical restrictive tendencies. The system of Ricardo, for

5

example, is centered about his doctrine of rent. And the rent principle draws its power from the law of diminishing returns. How cogently it is argued from these premises that wages tend to equal a bare subsistence and that capitalists ultimately are frustrated by land owners is known to all students of economics. Of course they also know that the occupations which pay only subsistence wages are becoming less numerous. And there is tragic satire in the thought that farmers are garnering the economic surpluses at the expense of the owners of business. There is no lack of logic in the classical structure—no essential contradiction in terms. There is, however, a wide divergence between the hypothesis and the relevant facts or, if you please, the engineering. As regards production the restrictive tendencies which fence in the economic processes described by the classicists are diminishing returns of land, labor and capital and increasing disutility of work. These matters, to the engineering mind, are not hypothetical foundations for system building; they are rather problems to be solved. Their attacks on these problems have resulted in a clearly defined recession of the point of diminishing returns and in a complete revision of our quantitative ideas concerning productivity.

Modern followers of the classical tradition who busy themselves with constructing static systems may argue that the changes wrought by engineering science do not impair the foundations of their work; that diminishing returns and increasing disutility, while becoming less closely restrictive, continue to operate as ultimate forces in creating the market equilibrium with which they are concerned. This position, again, on purely logical grounds is perfectly tenable; on experimental grounds it may be verified by reference to the inertia of physical bodies, including those which are human. The danger which they run, however, is that the conclusions which they reach may in time be as remote from the facts as those spun from the fine reason of Ricardo. Perhaps the trends of technology are themselves more important materials for systematic study than those of which static economics is built.

Of the various general factors of production whose proportionality is seen by economists as involving the problem of diminishing returns, the most frequent contemporary reference is to the total functions of management. Mr. John A. Hobson, while not addicted to classical patterns of economics, has given us a clear statement of this position.

> Although there must be conceived to be an ultimate limit to the economy of large production dependent on the necessity of having recourse to inferior or more expensive sources of raw materials or power, this, save in rare instances, is not the actual limit. So likewise, though the practical limits set upon the elaboration of machinery and the division of labor may fix the maximum size of an individual plant, it does not limit the size of a business, which may contain a number of such plants, and will tend to increase this number so long as the net economy of business administration is subserved thereby. This being so, the only substantial limit to the growth of a business, from the standpoint of economy of supply, has reference to the application of administrative power; in other words, of the factors that constitute the business-unit, *ability of control and management must be regarded as a constant factor.* (Italics not in original.)

There are plenty of engineering evidences to support Mr. Hobson's opinion that there is, for any industrial establishment, a "typical magnitude" which tends to yield maximum efficiency and economy—at least, there is at any given time. But to regard management as a "constant factor" is to ignore the expansion which has been given it by scientific management. The volume *Scientific Management in American Industry* shows management not to be a "constant factor"; i.e., it is not inherent and immutable. It consists rather of an acquired and flexible technique which may be adapted to changing conditions of size.

The precise points at which the engineering and economic sciences converge are the very conditions which give rise to scientific management. Although operations which are manual, or which are in conjunction with the most primitive tools, may be studied with reference to "efficiency," it is only with division of labor, mechanization and increased complexity of organization that the special techniques of industrial engineer and economist are invoked or, for that matter, exist. These conditions are, in brief, the characteristics of large-scale industry. That modern industry is, and should be, organized into large units is well, but differently, understood by both engineers and economists. The engineers see in large-scale operations a host of ways of promoting physical efficiency. The economists incline to regard it as a means of reducing unit costs of production. The directors and managers of industrial concerns, conditioned in their thinking by large and growing fixed charges and motivated by what their accounting systems tell them about unit costs, are pragmatic participants in the "mental revolution." Their participation is toward the nullification of Veblen's famous formula that industrial efficiency in producing goods is restricted by the interests of business men in securing profits. Business men have adopted and adapted scientific management for the very good reason that it pays. Perhaps it does not yet pay to give engineers *carte blanche* in industry; conceivably it never will. But the area in which they are permitted to work grows ever wider, and the Veblenian sabotage declines apace. The "mental revolution," like its industrial counterpart, does not take place overnight.

The problems of industrial engineers and economists converge insofar as physical efficiency and unit costs are complements to each other. Beyond that there is some divergence of their interests. The role of engineer is cast in a business setting. Scientific management has grown up in private and acquisitive industry. It could only cease being a doctrine and become a working principle when and because it promised to promote acquisition. It is true, of course, that the principle extends beyond the limits of individual factories and comprehends a host of services and facilities whose co-ordination and synchronization are essential to physical efficiency. It also is true that a general adoption of the methods of scientific management—tempered perhaps by careful consideration of the interests of wage-earning groups in steadiness of employment—would go far to promote the total industrial stability in which the economist is concerned. This is for the reason that scientific management replaces "matters of opinion," or "speculation" with measures and standards—with "facts" in the engineering sense of the word. That the measures and standards of scientific management may be used in creating such stability is assumed in the post-war programs of "rationalization" of industry. And yet there are ramifications through the economic structure of the very matters with which engineers are working—and to these ramifications the standards and controls of scientific management do not extend. Such for example, are the "abnormalities" of credit inflation, of unemployment, of over capitalization, of industrial depression, of over production. Engineers are thoroughly conscious of these mattters, and deeply concerned about them because they impede the work which engineers are trying to do within industry. Yet these are problems to which their techniques do not directly apply and concerning which they have no authority. Engineers and economists, the firmest of all believers in division of labor, leave each other to their respective tasks. And their dependence on each other is as great as that of workers on an assembly line.

Mr. Robert Bruère, in the masterly article on "Industrial Relations" which he contributed to *Scientific Management in American Industry*, treats a special phase of this divergency between engineers and economists. That scientific management has made important improvements in the immediate relations between employers and employes he is certain. Yet he points out:

> What goes on inside the factory is only one part of the problem of scientific management in its full meaning; the other lies within the life of the enveloping community. Important as are local shop rules and systems of wages, the common law and public opinion, together with the statutes through which the community gives expression to its unfolding objectives, not local shop rules or any system of wages, form the more important basis of industrial relations; for these are not merely relations between wage-working employes and property-owning employers as such, but are fundamentally relations between two groups of citizens who are equals in the sight of the law. The function of the modern science of industrial relations is not only to create harmony within the factory; its greater function is to give practical effect to this doctrine of equality in civil rights and individual opportunities which underlies all democratic government.

It is in clearing up the ambiguities in such matters as this, in substituting scientific knowledge for matters of opinion—in brief, in doing in their own field what the industrial engineers have done in theirs—that economists are challenged to participate in the "mental revolution."

News of the Sections

Japanese Branch

November 20: "Motion Study" by Lillian M. Gilbreth.

Central New York

November 22: "Next Steps in Production and Distribution" by Edward A. Filene.

December 20: "What Happens to a Trade Mark When a Patent Expires" by V. A. Dorsey.

New York Metropolitan

October 24: "Some Debated Questions in the Use of Group Incentives" by C. C. Balderston.

November 21: "Scientific Management as a Philosophy of Optimism" by Harlow S. Person, Frank B. Copley and Robert W. Bruère.

University of Pennsylvania

November 14: "The New Day in Management" by Henry P. Kendall.

Reviews

An Approach to Definite Forecasting. By Lincoln W. Hall, The University of Pennsylvania Press, Philadelphia, 1929, pages ix, 142.

Using a number of constructed and observed series, the author describes with considerable repetition a method of determining the principal components of a time series, viz., the cyclical fluctuation, the seasonal variation, and the secular trend, all of which are carefully defined for his purposes. Following this there is set forth in some detail a method by which these components and their relative intensities can be made to indicate the future aspects of the series. Quoting the author, "the purpose of this study is to expound a methodology which is readily adaptable to any and all types of public and private business for their own private use, the data to be expressed in the terms of the units which the particular company supplies to the world."

It is somewhat difficult for the reader to comprehend how the method of forecasting described can be applied first-hand for the ready determination of the future trend of some of the more common and everyday types of industrial commodity statistics. This may be due to the fact that underlying theory is subordinated to exposition of technique while the examples used, being limited to the more fundamental type, do not serve to illustrate adequately the application of this method to products that are beset with greater ranges of short time modifying influences.

For instance, how would the sales director of the X Y Z Motors Corporation use this method to forecast his 1930 and 1931 sales? According to it, he would have to depend for his results on analyses of previous sales of automobiles, both for the industry as a whole and for his company, segregated according to types and models manufactured. These analyses would reveal, possibly, the existence of certain cycles and other components which, with their relative intensities, could be used to set up what might be called a reasonable sales expectancy.

But the sales director must go beyond a reasonable expectation and definitely forecast a sales schedule that can be translated into terms of a definite production schedule. To do this, he may possibly have to take into consideration the probable effect of a poor cotton year in one section of the country, a good wheat year elsewhere, strikes and suspended industrial activity in certain areas, to say nothing of possible heavy market losses in most urban areas.

It might be argued that previous sales figures are the resultant of all phenomena that ever operated positively or negatively on the industry and, consequently, are a tested measure of what is likely to happen in the immediate future. This inclines toward action and reaction theory. But it is not sufficient for really definite forecasting, and to complete the picture one must study the relationships that exist between the various forces that have resulted in establishing certain figures. In other words, it is difficult to escape the necessity of using correlated data to interpret and crystallize into a definite numerical forecast the results obtainable by the the author's method.

Because of its novelty, this book should be of considerably more than ordinary interest to statisticians and others confronted with the necessity of forecasting the movements of time series. While monotonous at times, the expository style employed lends itself well to the subject.

T. R. Snyder[1]

The Useful Art of Economics. By George Soule, The Macmillan Company, New York, 1929, pages 250.

It is never fair to criticize an author for not doing what he does not intend to do. Mr. Soule has here aimed by a brief resumé of some outstanding economic problems, to show that the use of a fresh outlook and the newer methods in economics can probably point the way to improvements in the conduct of economic affairs. And in so far he has succeeded well. But Mr. Soule is an economist of unusual acumen and uncanny insight into the newer attack on economic theories and maladjustments. And those familiar with his shorter writings will, I believe, be a little disappointed that his theme is not a broader one, and his analysis not more inclusive. His aim is frankly popular, yet the effort at simplification has not resulted in a treatise which shows how the study of the newer economics can make sense and point or direction out of the plurality of economic activities. The plurality of problems is well suggested but the synthesizing effort seems to me to be left more to the reader than it should in view of the author's profound understanding of his subject. My own hope is that this volume is but the preface to a more inclusive statement of a new outlook on economic science and events, which Mr. Soule will presently give us. Meanwhile this book will serve a useful purpose, especially to business readers.

Ordway Tead[2]

---

[1] Assistant, Department of Manufacture, Chamber of Commerce of the United States, Washington, D. C.

[2] Editor of economic and business books, Harper & Brothers, and lecturer on personnel subjects, Columbia University.

How to Solve Typical Business Problems. By William R. Basset, The B. C. Forbes Publishing Company, New York, 1928, pages ix, 223.

The reader of this book is particularly impressed by the variety of solutions to business problems, solutions which require analytic study of the conditions surrounding the many aspects of such problems. Mr. Basset's solutions are quite usual and conservative in industrial engineering practice and are given in a manner which is calculated to impress upon the executive the importance of clear-sighted policy and energetic practice.

The author is on the lookout for maximum profits in all cases as is evidenced by his investigations to obtain such profits on all classes of sales and on what he calls the "outside dollar" of sales. By this latter term, Mr. Basset means those sales which are hard to secure after most of the business in a particular field is obtained. The reviewer is well aware of the fact that maximum earnings generally go hand in hand with variable sales policies which are not always sound policies in building for the future. There are many companies operating on the principles of insurance associations; they know that they cannot make a profit on each sale, but by standards of operation see to making a profit on their entire volume of business. Strict cost accounting is not an economic tool in all cases, neither is standard cost accounting. Their application depends on the nature of the business.

On the economic aspects of industry, Mr. Basset writes that industrial leaders do not consider the relationship between maintaining wages and their sales, in actual practice. Business depressions might more easily be avoided if the close relationship were fully recognized. The reviewer recognizes this relationship and attributes the fact that it is not more generally in effect to the industrial leader whose business does not immediately depend upon the wages he pays. On a broad scale the relationship is important and would require a co-operative industry for its utilization. In the example the author takes, the Ford organization, the management has evidently experienced a closer relationship between its payroll and sales than is the case with most concerns.

The matter of the division of profits into increasing wages for labor and a fair return for the functions of industry presents one of the most serious problems of our economic structure. The author correctly points out that better management methods with increased control over operations will do much toward meeting the problem. Industrial development in the United States particularly has demonstrated that unit costs of labor in production have decreased while wages have increased. In many industries, workers are being paid bare living wages because the managements have not secured a good control over their operations. What such managements save on labor goes into the costs of inefficient management and net profits.

In the matter of sales, the author presents a clear-sighted view of a matter which is very difficult of presentation. The matter of marketing, particularly marketing based on advertising appeal is still far from the scientific stage of measurement. There are times when the courageous application of advertising does not secure the hoped for sales. With the most conservative of the large companies, the relationship between sales and advertising is one of cause and effect. They note from past experiences, that for given expenses of advertising in certain mediums, a satisfying increase of sales and an added assurance of their good-will are secured. The author presents the importance of supplementing advertising with personal salesmanship and he makes the sound suggestion that the work of developing sales and of holding the developed sales should be given to types of men best suited for each kind of sales work. The reviewer makes the suggestion, based on his observation that the buyer does not like an abrupt change in salesmen particularly just after his first order is in, that both the "pioneer" and the "holder" types of salesmen go around together in developing new business and become acquainted with the trade.

In his chapter on purchasing, Mr. Basset presents for consideration the idea that it is just as ethical for the purchasing agent to show competing concerns the prices he is paying as it is to publish selling prices. Undoubtedly savings may be secured in this way, but the method in general practice has been found to lead to cut-throat competition. In instances, competing concerns do not object to the buyer's publishing their quotations.

In his concluding chapters, the author points out the trend of industrial development and its resultant economies. The large industrial organization is in a better position to furnish service because it has the facilities to constantly improve its methods and furnish its services at diminishing costs to the public. The importance of government supervision for fair business practice must be considered in this connection.

Altogether, Mr. Basset has courageously set forth his solutions to business problems, and he will be subjected to the criticism of men who have dealt with the same problems in other ways. The fact that he has secured beneficial results for his clients, entitles his solutions to the interest of executives who are on the lookout for savings.

George G. Berger[3]

A Text Book on Law and Business. By William H. Spencer, The University of Chicago Press, Chicago, 1929, pages ix, 1116.

Professor Spencer, who is Dean of the School of Commerce and Administration of the University of Chicago, several years ago published a three volume work under the title of "Law and Business." That book, though a collection of cases, contained also a considerable amount of interspersed textual matter and a large number of "Problems" or brief statements of facts. It presented the fundamental principles of law in those subjects especially related to business. It is used in various schools of business of university grade.

---

[3] Industrial Engineer, New York, N. Y.

However useful such a work as the earlier three volumes by Dean Spencer may be for organized classroom instruction, it does not invite the man who wants to read by himself. The new book, which is being here reviewed, says in its preface that it is intended to supplement court decisions as materials of instruction in schools of business. Though well designed for such a purpose it is also exactly what a layman needs who is in earnest about reading some law for himself.

Most books which have been written on law for the business man tempt one to the hackneyed phrase "for the tired business man." They endeavor to be simple, easy reading with a result that the reader cannot get much from them because there is not much to get. Anything of substantial mental value calls for some substantial mental effort. The fact that law is not an altogether easy thing is not an adverse criticism of law. Life is seldom easy.

A reader will find Dean Spencer's new book as easy as it can be and also be substantially valuable. Difficulties are those of the law itself and not of the Dean's form of presentation. That runs page after page of the lucid statement of a man who both knows his subject and knows how to write. The layman who wishes to add some knowledge of the law to his mental equipment may profitably take Dean Spencer as his guide.

The reviewer ventures to step aside from the straight path of a review to urge the layman to read as much law as Spencer's "Law and Business" presents, and to do so both as a cultural matter and as a matter of direct practical bearing on affairs. The writer mentions the fact that he is a practicing lawyer in order to lay the foundation for testifying here that in his experience the greater acquaintance a client has with the law the easier the client is to serve and the more value he is likely to get out of a given amount of service.

HASTINGS LYON[4]

Harvard Business Reports. Compiled by and published for the Graduate School of Business Administration, Harvard University, by the A. W. Shaw Company, Chicago, Vol. 5, 1928, pages 622; Vol. 6, 1928, pages 554. $7.50 per volume.

These two volumes are continuations in the Harvard series of case material. They are based on a vast amount of first-hand study. Volume 5 consists of a miscellaneous collection of cases covering a large number of different aspects of business, with commentaries by over a score of the various members of the Harvard faculty. Volume 6 is a more specialized group of cases dealing with the subject of industrial marketing, and was done under the direction of Professors Melvin T. Copeland and Neil H. Borden, who supply the commentaries. The books are in the usual buckram binding, heavy in weight, and closely resemble the legal tomes on which they appear to be modeled.

It is difficult to appraise the value of this type of material, especially when consideration is given to the vast amount of research and funds required to produce them. As they are designed specifically for the Harvard School's method of teaching, they are no doubt as technically suitable for this purpose as the available time and facilities could make them. If, however, they are regarded not merely as text books for class instruction but definite source books to which active men of affairs will refer when confronted with practical problems of business, some of the issues raised in a review of the previous four volumes still arise.[5] The responsibility, no doubt, is upon the Harvard School to check up the actual use to which these volumes are being put outside of the classroom, so that it may either continue to improve or expand the Harvard business series as it now is, or modify it so as to make it of wider general service than one would suspect from an attempt to wade through the material in its present form.

HERMAN FELDMAN[6]

Scientific Sales Management Today. By Charles W. Hoyt,[7] The Ronald Press Company, New York, 1929, pages v, 253.

The present volume brings up to date the author's viewpoint on sales management, first presented by him some years ago in his book *Scientific Sales Management.*

Unquestionably a man of wide experience and contacts in the sales and advertising world, Mr. Hoyt brought to this present work a thorough belief in the progress of sales management along scientific lines, and developed many illustrations from experience and from his extensive reading of the need for greater application of scientific methods.

The book is, however, more of an argument for such methods than an exposition of what they are and how they may be applied.

Interesting chapters on selecting and training salesmen, equipping them, establishing quotas, planning conventions, etc., are illustrated by incidents from personal experience.

It was probably inevitable that frequent reference should be made and one whole chapter devoted to the "scientific" value of direct mail support of selling effort, since the author was long recognized as a specialist in this form of advertising as a sales stimulus.

The concluding chapter is a vigorous outline of the need for self education on the part of sales managers, with a philosophical analysis of how such education may be acquired.

NORMAN HORN[8]

Planned Marketing. By Vergil D. Reed, The Ronald Press Company, New York, 1929, pages xi, 346.

In his introduction Mr. Reed states, "This book is intended to serve as a practical guide in planning the marketing of manufactured goods." Mr. Reed has done this and in doing so necessarily has had to analyze and discuss all of the various factors that affect or influence market planning.

---

[4] Member of New York Bar; Lecturer in Finance, School of Business, Columbia University, New York, N. Y.

[5] *Bulletin of the Taylor Society,* Vol. XII, No. 6, December, 1927.

[6] Professor of Industrial Relations, Amos Tuck School of Administration and Finance, Dartmouth College, Hanover, N. H.

[7] Deceased. Member Taylor Society 1922 to 1929.

[8] Sales Manager, McCallum Hosiery Co., Northampton, Mass.

All of these many and different factors together with the significance of their inter-relation are presented in a concise but complete manner and well illustrated by examples.

The book is divided into six parts.

In Part I, "Some Serious Cases and Successful Cures," several actual cases involving marketing policies are stated and analyzed.

Part II, "What Makes a Marketing Plan," discusses the different factors influencing marketing; the company and its setting, the product, the market, distribution, advertising and the co-ordination of factors.

Part III, "The Market Survey," gives the procedure of making a survey and covers the different methods employed and the value and pitfalls in each.

Part IV, "Building the Foundation of the Marketing Plan," shows the application of the survey to policy building and also discusses Budgets and Quotas.

Part V, "The Advertising Plan," is concerned entirely with advertising. In itself it is an excellent analysis of advertising purposes and plans, but the relationship of advertising to the general marketing plan is kept in the foreground. The author states, "After all, the advertising campaign is but one part of a marketing plan—not the plan." The question of the amount of the advertising appropriation is discussed in a clear-cut manner as well as the question of successes and failures in advertising.

Part VI, "Keeping the Plan Fresh," can hardly be called a summary but treats with market trends, improving old products, finding new markets and new outlets and shaving distribution costs, all of which utilize facts brought out in the preceding parts of the book and show the inter-relation of different marketing factors.

The character of the book is well expressed by Paul H. Nystrom, who wrote the introduction to the book: "It is full of practical suggestions . . . . In fact, it is veritably an encyclopedic treatment of this important subject. This work deserves the careful attention of men engaged in the difficulties of forming and executing plans for the marketing of goods."

C. L. Barnum[9]

The Labor Movement in the United States: 1860-1895. By Norman J. Ware, D. Appleton & Company, New York, 1929, pages xvii, 409.

This volume is a continuation of the history of the American labor movement which Professor Ware presented in his earlier book, *The Industrial Worker*: 1840-1860. The present work is primarily a study of the Noble Order of the Knights of Labor, which was founded in 1869, and from about 1879 to 1890 was the most important labor organization in the country. In a series of chapters which, though often too detailed, are frequently characterized by brilliant character sketches, spirited analysis, humorous turns and a fine sense for the dramatic, the author describes the relation of the organization to the Catholic Church, the trade unions, and to the new American Federation of Labor and its predecessor. The unsteady career of the Order, its experience with strikes, boycotts, co-operation and politics, and the part played by its leaders, all receive attention. In spite of his justifiable preoccupation with a single union, Professor Ware does not neglect the other organizations of the period.

The study is especially important because it corrects several oft-repeated generalizations about the Knights of Labor. Instead of being primarily based upon the so-called "mixed" or "labor" local, to which workers of any craft or industry might belong, the organization originated with a strictly craft union, its early locals were all of the same type, and throughout its career such unions remained members of it, were often organized by it, and in several cases joined it as national or district trade assemblies. The Order is often cited as an example of a highly centralized union. The author shows that though on paper authority was concentrated at the top, in practice the local and district assemblies did pretty much as they pleased.

Two things stand out in one's mind after reading this book. The first is the catholicity of the Knights of Labor. It was ready and willing to organize everybody everywhere. Craft exclusiveness and trade aristocracy had no place in its philosophy. Its motto was, "An injury to one is the concern of all." The second point is the unplanned and fortuitous nature of its career. What it decided to do it could not accomplish. What it wished to avoid, as, for example, strikes and boycotts, were forced upon it. It planned centralization and experienced decentralization. It strove many years for an increase in membership, and in 1886 found its desires so well met that it had to call a halt to the formation of new assemblies. Its leaders, despite their conservatism, found themselves charged with responsibility for the Chicago anarchists, and throughout the greater part of its history it was led by Terence Powderly, who neither looked nor acted like a labor leader. Indeed, Professor Ware declares that "He acted more like Queen Victoria at a national Democratic convention." The miracle of it all is that this organization was for years the most important and influential labor union in the country.

Edward Berman[10]

Industrial Explorers. By Maurice Holland, with Henry F. Pringle, Harper & Brothers, New York, 1929, pages xii, 347.

The book aims to explain in popular form what is meant by industrial research by narrating the achievements of nineteen leaders in this field. For the most part the subjects chosen are those with which the general public comes in contact in everyday life—paper, bread, coffee, fish, glass, kodaks, leather, with the notable exception of automobiles. The methods used and the results accomplished by research workers are set forth in attractive fashion; and the chapters are not seriously marred by the efforts of the authors to bring the treatment down to the supposed level of intelligence of the average newspaper reader. When presenting the work of Arthur D. Little and of Willis R. Whitney, they are very successful in giving a portrait of the man himself; in other cases, their enthusiasm for the particular wonder story in hand leads them to leave the hero standing on the sidelines.

---

[9] Consulting Engineer, Roosevelt & Barnum, Inc., New York, N. Y.

[10] Assistant Professor of Economics, University of Illinois, Urbana, Ill.

The theme of the book is the imperative necessity of industrial research. Since the idea is kept before the reader through a wide range of examples. the iteration does not become monotonous, and the vigorous fashion in which the argument is driven home is well calculated to make the book serve the useful purpose for which it is designed.

HENRY G. PEARSON[11]

An American Business Adventure. By Mark H. Dix, Harper & Brothers, New York, 1928, pages viii, 182.

This is an absorbing story of an adventure in human relations, simply and effectively told by one of the sons of the central figure, Henry A. Dix. For those of us who are interested in observing changing relationships in industry the book is only the beginning of a story whose continuation we should like to read some years hence.

Henry A. Dix came to this country in 1896, at the age of forty-two, to escape persecution as a Jew in Russia and to make a new life of freedom for himself and his family in America. The book tells how fully he was able to realize this aim. He brought with him considerable means, as well as high ideals, sound common sense and much real kindliness. When his first farming venture did not turn out well, he invested all of these assets in a small manufacturing business beside his home in a little New Jersey town. There he made house dresses that were simple, attractive, well-made and at the same time cheap. The business grew to include two other New Jersey factories and a New York headquarters and sales office. But growth was never Mr. Dix's main idea. Quality and right conditions for all concerned in the enterprise were his interests. When we read that he operated on a five-day, forty-hour week as early as 1912; granted vacations with pay even to piece workers; went through the depression of 1920 without a reduction in working time or wages (and this in the garment industry); steadily refused to give out work to the New York contract sweat shops; that he early eliminated traveling salesmen, did not try to encroach on the territory of his competitors and succeeded in resisting the urge to expand beyond a certain point, in spite of the general tendency, it is hard to believe that we are reading facts.

After twenty-five years of this adventure Mr. Dix turned over the ownership and management of his business to a small group of his former executives. All the common stock of the company was made out to these men on the condition that they pay him in yearly instalments, on the basis of the book value of the concern, out of their net profits. They do not have to complete payment at any given time but he holds first and second preferred stock until such time as the obligation is met. In order that all the employes might participate in the profits of the business, he made provision for granting them shares of a special 7 per cent preferred stock on a basis of length of service and position. Something of what these new employe-owners have done, under Mr. Dix's guidance, in the five years since the transfer is told in the book. What we are eager to hear is the story of their progress after his guidance has been withdrawn.

The writer of this book was perhaps too intimately concerned with its material to give us an unbiased account. Its very sentimentality, however, which has every evidence of being sincere, is in pleasant contrast to the stories of many industrial enterprises of the day. The book should not be described but read—especially by employers.

HELEN A. CARNES[12]

The Secretary's Handbook. By Sarah Augusta Tainter and Kate M. Monro, The Macmillan Company, New York, 1929, pages xii, 372.

This little book brings under one cover much of the information constantly needed in an office; it is being used with profit in the office of the Taylor Society. Extensive references to other authoritative works supplement it adequately.

Books Received

Arbeitspsychologische Leitsätze für den Zeitnehmer. By Walther Poppelreuter, Verlag von R. Oldenbourg, Munich and Berlin, 1929, pages viii, 99. (8 marks)

Business and Professional Speaking. (3 Vols.) By William P. Sanford and Willard H. Yeager, A. W. Shaw Company, Chicago, 1929, pages 374. ($6.50)

Earnings of Factory Workers 1899 *to* 1927. An Analysis of Pay-Roll Statistics. By Paul F. Brissenden, The United States Government Printing Office, Washington, 1929, pages xxi, 424.

Fundamentals of Scientific Office Management, The. By W. H. Leffingwell, Management Research Groups, General Series, No. 8, London, 1929, pages 20.

Significant Post-War Changes in the Full-Fashioned Hosiery Industry. By George William Taylor, University of Pennsylvania Press, Philadelphia, 1929, pages xi, 130. ($1.50)

Trends in Foundry Production (In the Philadelphia Area). By Anne Bezanson and Robert Gray, University of Pennsylvania Press, Philadelphia, 1929, pages xvi, 77. ($1.50)

Zeitstudie und Betriebsüberwachung im Arbeitsschaubild. By Walther Poppelreuter, Verlag von R. Oldenbourg, Munich and Berlin, 1929, pages vi, 86. (5 marks)

---

[11] Professor of English in charge of the department, Massachusetts Institute of Technology, Cambridge, Mass.

[12] Taylor Society, New York.

Officers of the Taylor Society Incorporated

President .... Henry P. Kendall, President, The Kendall Company, Boston, Mass. (1929)
Vice-President .... George D. Babcock, Vice-President, Central Lumber Mills, Inc., Fletcher, N. C. (1929)
Vice-President .... Henry Bruère, 1st Vice-President, Bowery Savings Bank, New York. (1930)
Treasurer .... Edward W. Clark, 3d, E. W. Clark & Co., Philadelphia, Pa. (1928)
Managing Director .... Harlow S. Person, Taylor Society Incorporated, 29 W. 39th St., New York.
Associate Secretary .... Ernest G. Brown, Taylor Society Incorporated, 29 W. 39th St., New York.
(Technological)
Associate Secretary .... Mason L. Merrill, Taylor Society Incorporated, 29 W. 39th St., New York.
(Membership)
Assistant Editor and Office Manager .... Helen A. Carnes, Taylor Society Incorporated, 29 W. 39th St., New York.

Board of Directors

George D. Babcock, Central Lumber Mills, Inc., Fletcher, N. C. (1929)

Henry Bruère, Bowery Savings Bank, New York. (1930)

Edward W. Clark, 3d, E. W. Clark & Co., Philadelphia, Pa. (1929)

Henry P. Kendall, The Kendall Company, Boston, Mass. (1929)

Morris E. Leeds, Leeds & Northrup, Philadelphia, Pa. (1930)

B. Eugenia Lies, R. H. Macy & Co., Inc., New York. (1929)

H. S. Person, Taylor Society Incorporated, New York (1930)

Erwin H. Schell, Massachusetts Institute of Technology, Cambridge, Mass. (1930)

G. E. Schulz, Consulting Engineer, New York. (1929)

Past Presidents

James Mapes Dodge (deceased)

Harlow S. Person, Taylor Society Incorporated, New York.

J. E. Otterson, Western Electric Company, New York.

Henry S. Dennison, Dennison Manufacturing Co., Framingham, Mass.

Richard A. Feiss, Consulting Management Engineer, Boston, Mass.

Percy S. Brown, Industrial Engineer, Boston, Mass.

Morris L. Cooke, Consulting Engineer, Philadelphia, Pa.

Local Sections, Foreign and Student Branches

Eastern Massachusetts

Secretary-Treasurer: Raymond L. Tweedy, Manufacturers Research Association, 80 Federal St., Boston, Mass.

Japan

Managing Director: Yoiti Ueno, Institute of Industrial Efficiency, Siba Park, Tokyo.

New York Metropolitan

Secretary-Treasurer: Chalice M. Kelly, Union Carbon and Carbide Company, 30 E. 42nd St., New York.

Central New York

Secretary-Treasurer: R. S. Gardner, L. C. Smith & Corona Typewriters, Inc., Syracuse, N. Y.

Student Branches

Colgate University, Hamilton, N. Y.
Ohio State University, Columbus, Ohio.
University of North Carolina, Chapel Hill, N. C.
University of Pennsylvania, Wharton School, Philadelphia, Pa.

—announcing a special prepublication offer on the new

Scientific Management in American Industry

By THE TAYLOR SOCIETY

H. S. PERSON, *Editor*

The first up-to-date, authoritative discussion of the principles and methods of scientific management to be written in over ten years, is now about to be published.

Table of Contents

FOREWORD by MORRIS LLEWELLYN COOKE, Past President of the Taylor Society.

SECTION I, Introduction

I. The Origin and Nature of Scientific Management, by HARLOW S. PERSON, Taylor Society, New York.
II. The New Attitude Toward Management, by HARLOW S. PERSON.
III. The Influence of Scientific Management, by EDWARD EYRE HUNT, Secretary President's Conference on Unemployment, Washington.

SECTION II, Management Research

IV. Research for General Administration, by ROBERT W. BURGESS, Western Electric Company, New York.
V. Research for Merchandising and Selling, by PAUL T. CHERINGTON, J. Walter Thompson Co., New York, and Stanford University, California.
VI. Research for Clerical Operations. by WALTER D. FULLER, Curtis Publishing Company, Philadelphia.
VII. Research for Factory Operations. by GEORGE D. BABCOCK, Central Lumber Mills, Inc., Fletcher, N. C.
VIII. Personnel Research, by ORDWAY TEAD, Harper & Brothers and Columbia University, New York.

SECTION III, Management Standards

IX. Classification and Symbolization, by MORRIS LLEWELLYN COOKE.
X. Functional Organization, by HENRY H. FARQUHAR, Field Survey Division, Hahn Department Stores, Inc., New York.
XI. General Administrative Standards. by HOWARD COONLEY and JOSEPH H. BARBER, Walworth Company, Boston.
XII. Merchandising Standards, by JOHN S. KEIR and HENRY S. DENNISON, Dennison Manufacturing Company, Framingham, Mass.
XIII. Sales Operating Standards, by JOHN S. KEIR and HENRY S. DENNISON.
XIV. Clerical Operation Standards, by WILLIAM H. LEFFINGWELL, W. H. Leffingwell, Inc., New York.
XV. Factory Operation Standards, by LESLIE E. BRYANT, Armstrong Cork Company, Linoleum Division, Lancaster, Pa., and G. E. SCHULZ, Industrial Engineer, New York.
XVI. Labor Standards by C. S. YOAKUM, University of Michigan, Ann Arbor, Mich.
XVII. Practical Aspects of the Development and Use of Standards, by THOMAS W. MITCHELL, Federal Trade Commission, Washington.

SECTION IV, Control: 1. The Control of Operations

XVIII. Continuous, Intermittent and Variable Processing, by RICHARD H. LANSBURGH, University of Pennsylvania, Philadelphia.
XIX. General Administrative Control, by JOHN H. WILLIAMS, Industrial Engineer, New York.
XX. Control of Sales Operations, by JOHN S. KEIR and HENRY S. DENNISON.
XXI. Control of Office Operations, by F. L. ROWLAND, Lincoln National Life Insurance Company, Fort Wayne, Ind.
XXII. Control of Shop Operations, by H. K. HATHAWAY, Industrial Engineer, San Francisco.

SECTION V, Control: 2. The Maintenance of Standards

XXIII. Inspection of Physical Standards, by HARLOW S. PERSON.
XXIV. Inspection of Performance, by HARLOW S. PERSON.
XXV. The Maintenance of Labor Standards, by ORDWAY TEAD.
XXVI. Inspection of Results in Terms of Costs, by NORRIS M. PERRIS, Stevenson, Harrison and Jordan, New York.

SECTION VI, Human Aspects

XXVII. Leadership in Scientific Management, by HARLOW S. PERSON.
XXVIII. The Response of Workers to Scientific Management
I. Experience in a Non-Union Shop, by ERNEST G. BROWN, Taylor Society, New York.
II. Experience in a Union Shop, by DR. N. I. STONE, Industrial Counselor, New York.
XXIX. Industrial Relations, by ROBERT W. BRUÈRE, J. C. Penney Foundation and Survey Magazine, New York.

This volume, under the editorship of DR. H. S. PERSON, Managing Director of the Taylor Society, constitutes a thorough and readable statement of the present status and procedure of scientific management. It aims to be as definitive for the present day as was Frederick W. Taylor's "Principles of Scientific Management" when it first appeared.

SPECIAL ORDER FORM
(Good only until July 15, 1929)

TAYLOR SOCIETY,
29 West 39th St., New York.

Please find enclosed $4 for one copy of *"Scientific Management in American Industry,"* to be delivered when ready in the early fall of 1929.

Name ....

Address ....

Special Offer

All orders received on the attached order form will be honored up to July 15, 1929, *if money accompanies the order,* at $4 (regular price $5 to $7).

To be published by
HARPER & BROTHERS
Established 1817
New York, N. Y.

Officers of the Taylor Society Incorporated

President	Henry P. Kendall, President, The Kendall Company, Boston, Mass. (1930)
Vice-President	John G. Aldrich, President, New England Butt Company, Providence, R. I. (1931)
Vice-President	Henry Bruère, 1st Vice-President, Bowery Savings Bank, New York. (1930)
Treasurer	Edward W. Clark, 3d, E. W. Clark & Co., Philadelphia, Pa. (1930)
Managing Director	Harlow S. Person, Taylor Society Incorporated, 29 W. 39th St., New York.
Associate Secretary (Technological)	P. E. Henderson, Taylor Society Incorporated, 29 W. 39th St., New York.
Assistant Editor and Office Manager	Helen A. Carnes, Taylor Society Incorporated, 29 W. 39th St., New York.

Board of Directors

John G. Aldrich, New England Butt Company, Providence, R. I.

Henry Bruère, Bowery Savings Bank, New York. (1930)

John M. Carmody, McGraw-Hill Publishing Company, Chicago, Ill. (1931)

Edward W. Clark, 3d, E. W. Clark & Co., Philadelphia, Pa. (1930)

Henry P. Kendall, The Kendall Company, Boston, Mass. (1930)

Morris E. Leeds, Leeds & Northrup, Philadelphia, Pa. (1930)

Louise C. Odencranz, Employment Center for the Handicapped, New York. (1931)

H. S. Person, Taylor Society Incorporated, New York. (1930)

Erwin H. Schell, Massachusetts Institute of Technology, Cambridge, Mass. (1930)

Past Presidents

James Mapes Dodge (deceased)

Harlow S. Person, Taylor Society Incorporated, New York.

J. E. Otterson, Western Electric Company, New York.

Henry S. Dennison, Dennison Manufacturing Co., Framingham, Mass.

Richard A. Feiss, Consulting Management Engineer, Boston, Mass.

Percy S. Brown, Industrial Engineer, Boston, Mass.

Morris L. Cooke, Consulting Engineer, Philadelphia, Pa.

Local Sections, Foreign and Student Branches

Eastern Massachusetts

Secretary-Treasurer: Raymond L. Tweedy, Manufacturers Research Association, 80 Federal St., Boston, Mass.

Japan

Managing Director: Yoiti Ueno, Institute of Industrial Efficiency, Siba Park, Tokyo.

New York Metropolitan

Secretary-Treasurer: Chalice M. Kelly, Union Carbide Company, 30 E. 42nd St., New York.

Central New York

Secretary-Treasurer: R. S. Gardner, L. C. Smith & Corona Typewriters, Inc., Syracuse, N. Y.

Student Branches

Colgate University, Hamilton, N. Y.
Ohio State University, Columbus, Ohio.
University of California, Berkeley, Cal.
University of North Carolina, Chapel Hill, N. C.
University of Pennsylvania, Wharton School, Philadelphia, Pa.

An Open Forum

A meeting of the Taylor Society is an open forum.

The public is invited. There is no "registration" or other admission charge.

All members and all guests are welcome at all sessions, no matter how "particular" the subject.

Every subject is considered from the point of view of its bearing on general management.

Publications of the Taylor Society are available by subscription to the public.

"The open mind toward experience requires the open forum for appraisal of experience. For just as the field of determination of facts by scientific method is growing broader, the field of the determination of the significance of the facts is likewise growing broader, this latter determination being a group rather than an individual responsibility."

A Management Engineer's Creed

The sublimest duty of the engineer is to keep the faith:

The faith of the client that he will not undertake what he knows to be beyond his ability; and that with respect to what he undertakes he will give conscientious service to the limit of his ability;

The faith of his fellow engineers that he will remain true to his science and will magnify and not cheapen it; and that he will base his efforts for public recognition upon ability, scientific attainment and actual performance, and not upon ambiguous self-laudation;

The faith of the community that he will undertake no service inconsistent with the public welfare and that in service consistent with the public welfare, but in which the interests of groups appear to come in conflict, he will judge carefully and sympathetically the claims of rival interests, and attempt to establish that unity of purpose which promotes the public welfare.

L6Ap'30